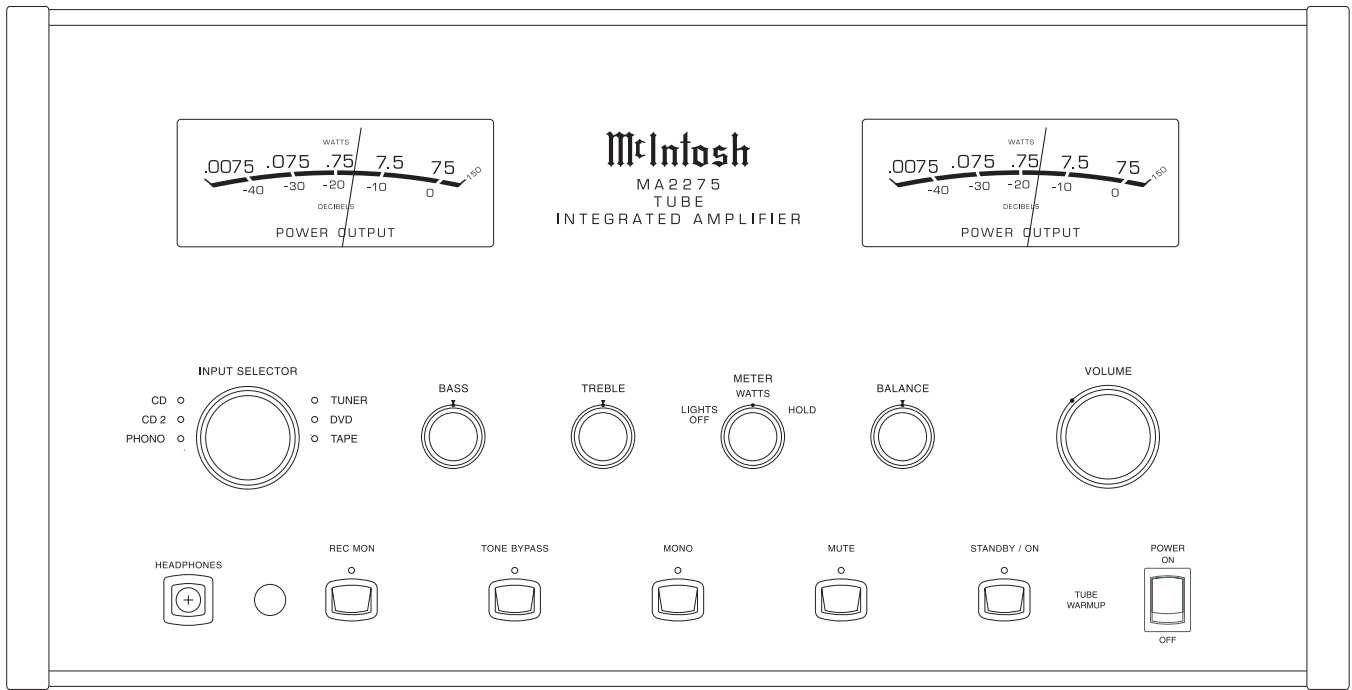




# MA2275

## TUBE INTEGRATED AMPLIFIER



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# SERVICE MANUAL

# PERFORMANCE SPECIFICATIONS

## Power Output

Minimum sine wave continuous average power output per channel, both channels operating is:  
75 watts into a 2 ohm load  
75 watts into a 4 ohm load  
75 watts into an 8 ohm load

## Rated Power Band

20Hz to 20,000Hz

## Total Harmonic Distortion

Maximum Total Harmonic Distortion at any power level from 250 milliwatts to rated power output is:  
0.5% for a 2, 4 or 8 ohm load

## Frequency Response

+0, -0.5dB from 20Hz to 20,000Hz  
+0, -3dB from 10Hz to 50,000Hz

## Sensitivity

Phono: 4.4mV for 2.5V preamp output  
High Level: 450mV for 2.5V preamp output  
Power Amplifier Input: 2.5V for rated output

## A-Weighted Signal To Noise Ratio

Phono Input: 80dB below 10mV input  
High Level: 97dB below rated output  
Power Amplifier: 110dB below rated output

## Intermodulation Distortion

Maximum Intermodulation Distortion if instantaneous peak output does not exceed twice the rated output, for any combination of frequencies from 20Hz to 20,000Hz is:  
0.5% for a 2, 4 or 8 ohm load

## Input Impedance

Phono: 47k ohms, 65pF  
High Level: 22k ohms

## Maximum Input Signal

Phono: 90mV  
High Level: 8V

## Preamplifier Maximum Voltage Output

Phono: 8V  
High Level: 8V  
Main Out: 8V at preamp output

## Voltage Gain

High Level to Tape output: 0dB  
High Level to Preamp output: 15dB

## Wide Band Damping Factor

Greater than 18

## Power Requirements

100 Volts, 50/60Hz at 3.6 amps  
110 Volts, 50/60Hz at 3.6 amps  
120 Volts, 50/60Hz at 3.6 amps  
220 Volts, 50/60Hz at 1.8 amps  
230 Volts, 50/60Hz at 1.8 amps  
240 Volts, 50/60Hz at 1.8 amps

*Note: Refer to the rear panel of the MA2275 for the correct voltage.*

## Preamplifier Tube Compliment

2 - 12AX7A Phono Circuitry  
2 - 12AX7A High Level Circuitry

## Power Amplifier Tube Compliment

2 - 12AT7  
4 - KT88/6550


## Overall Dimensions

Width is 17-3/4 inches (45.09cm), Height is 10-1/8 inches (25.72cm) including feet, Depth is 18-3/4 inches (47.63cm) including the Front Panel and Knobs

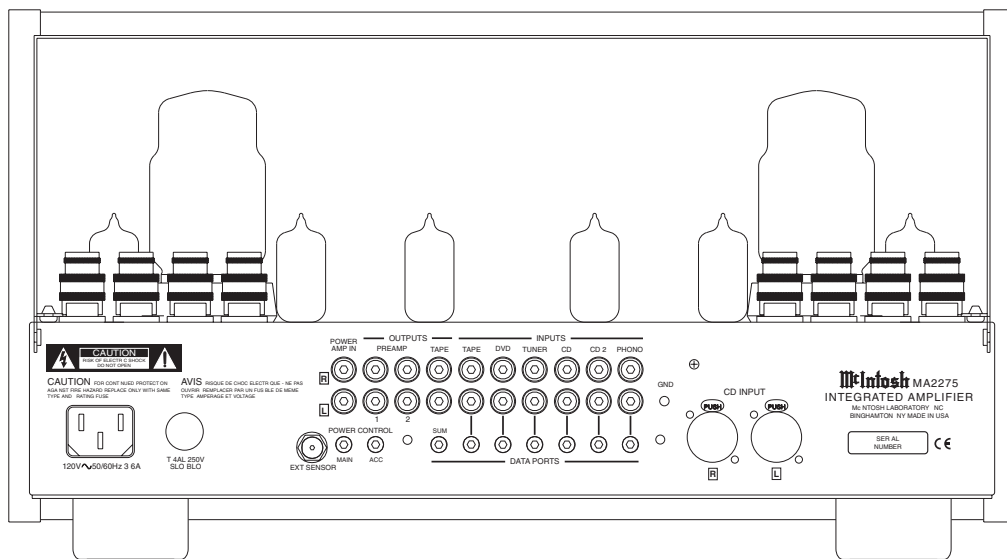
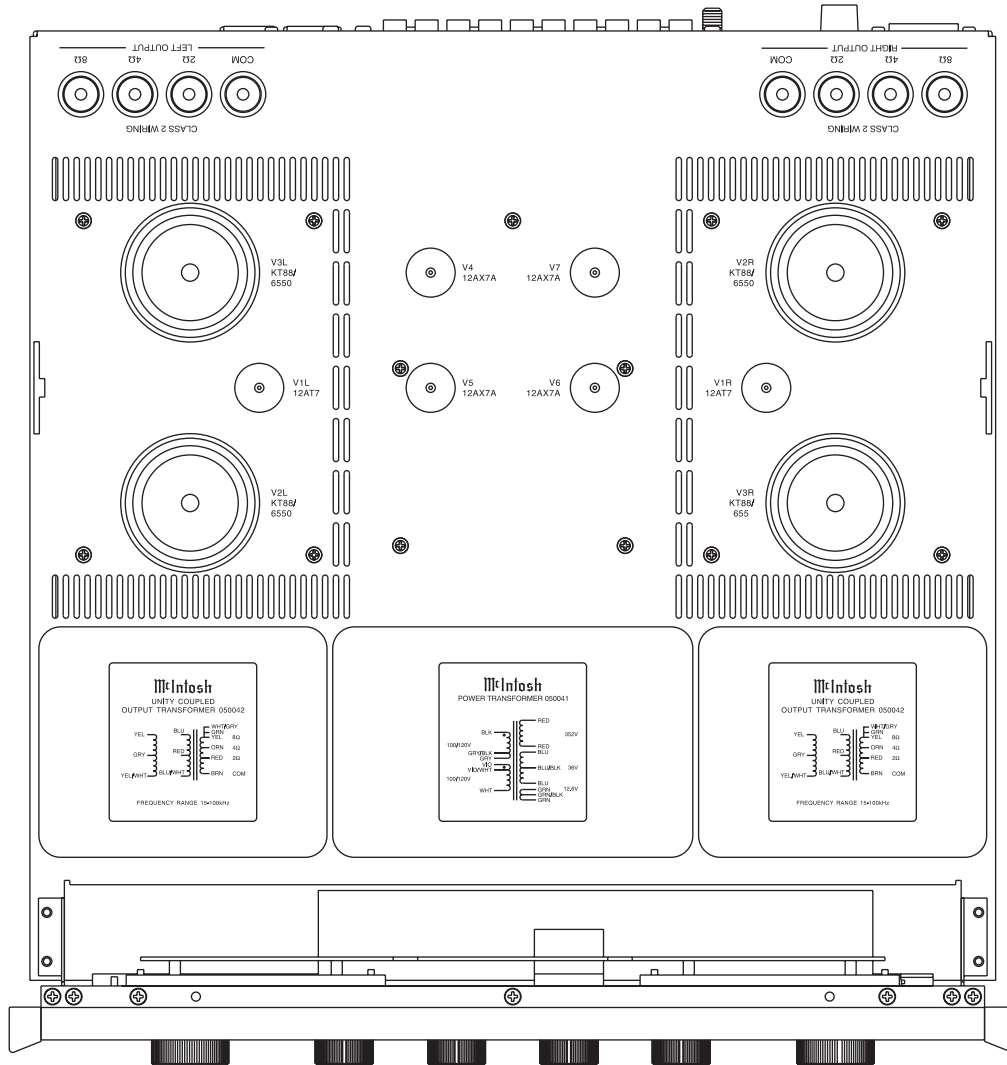
## Weight

77 pounds (35 kg) net, 110 pounds (50 kg) in shipping carton

# NOTES

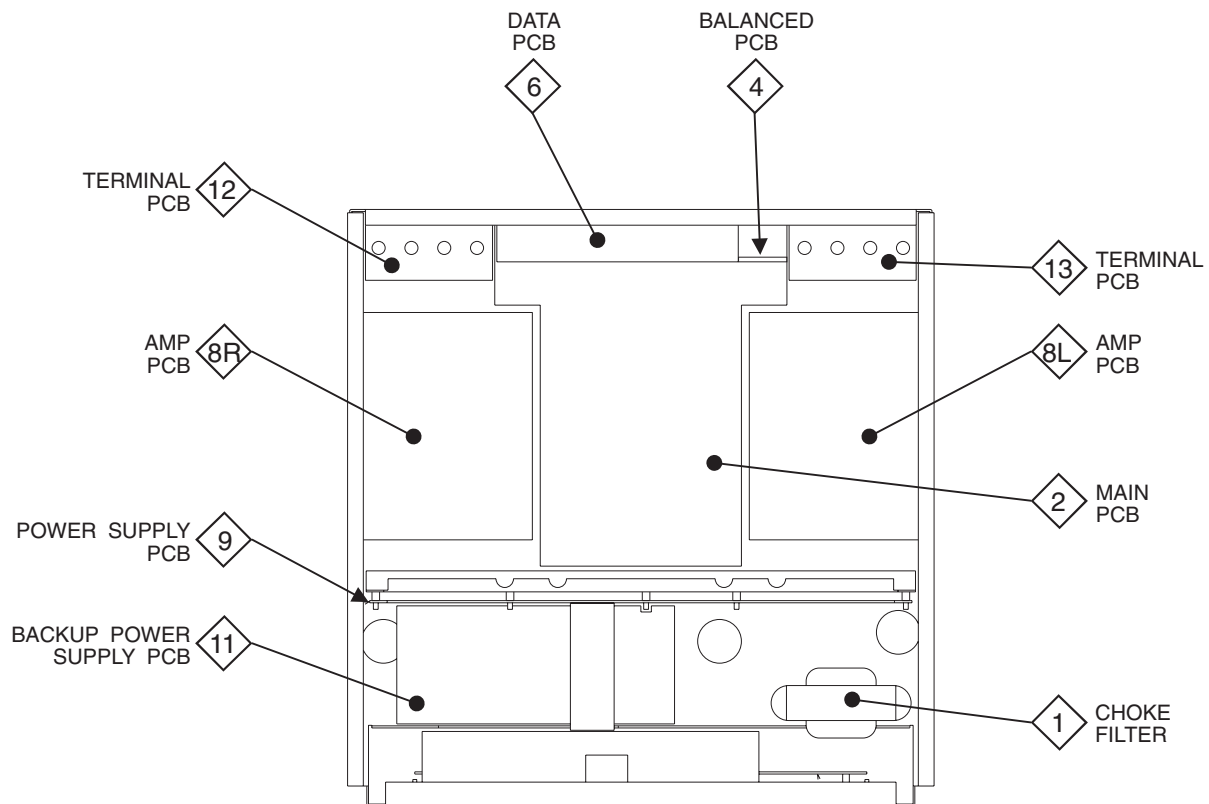
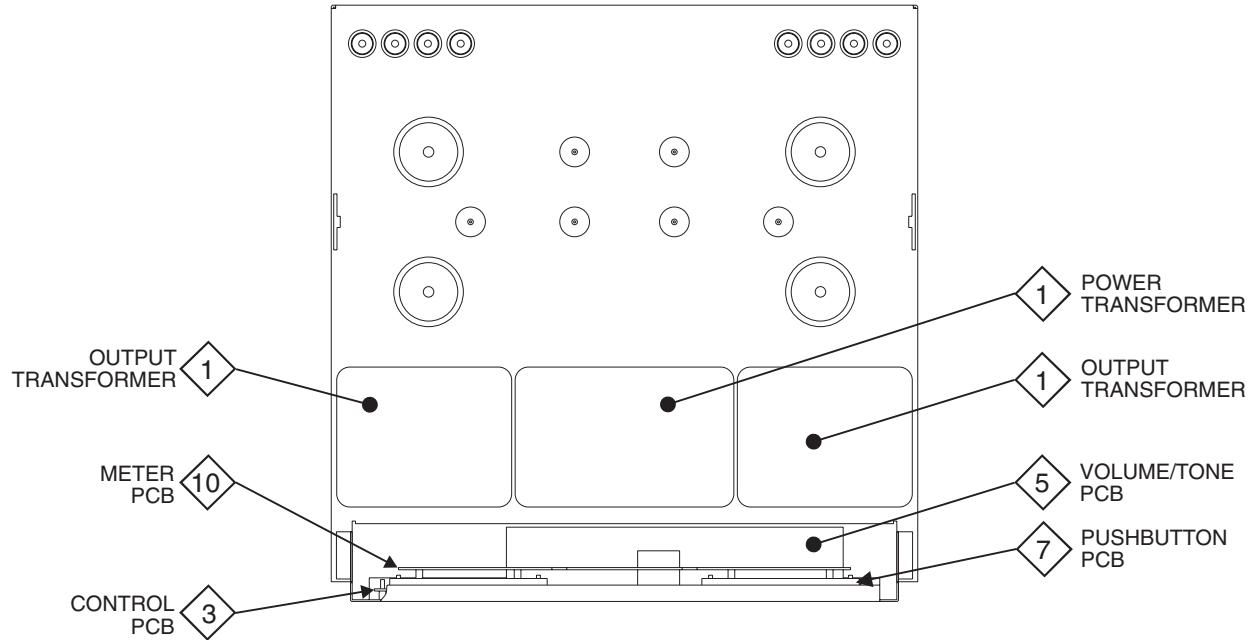
1. The heavy lines on the schematic denote the primary signal path.
2. Unless otherwise noted, all voltages indicated on the schematics are measured under the following conditions:
  - a. AC input at 120 volts, 50/60Hz.
  - b. All voltages are +/-10% with respect to ground. A high impedance (10 megaohm) voltmeter must be used.
3. Unless otherwise specified:
  - a. Resistor values are in ohms.
  - b. Capacitor values are microfarads (uF).
  - c. Inductor values are in microhenries (uH).
4. On PC board drawings, Square pad indicates:
  - a. Polarized Capacitors - Positive
  - b. Diodes - Cathode
  - c. Others - Pin 1
5. **WARNING**  
Parts marked with the symbol  have critical characteristics. Use only replacement parts recommended by the manufacturer.

# TOP AND REAR VIEWS



# SECTION LOCATIONS

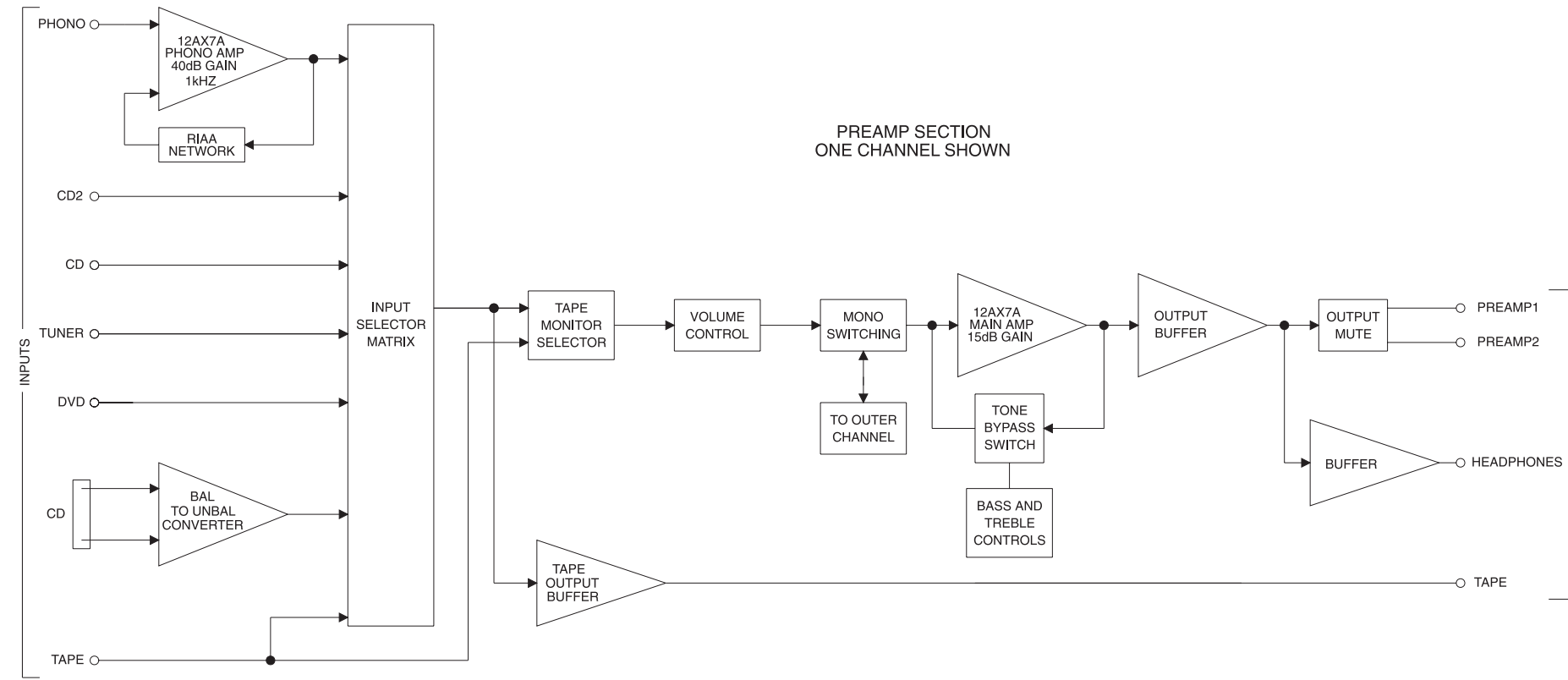
TOP VIEW WITH COVERS REMOVED



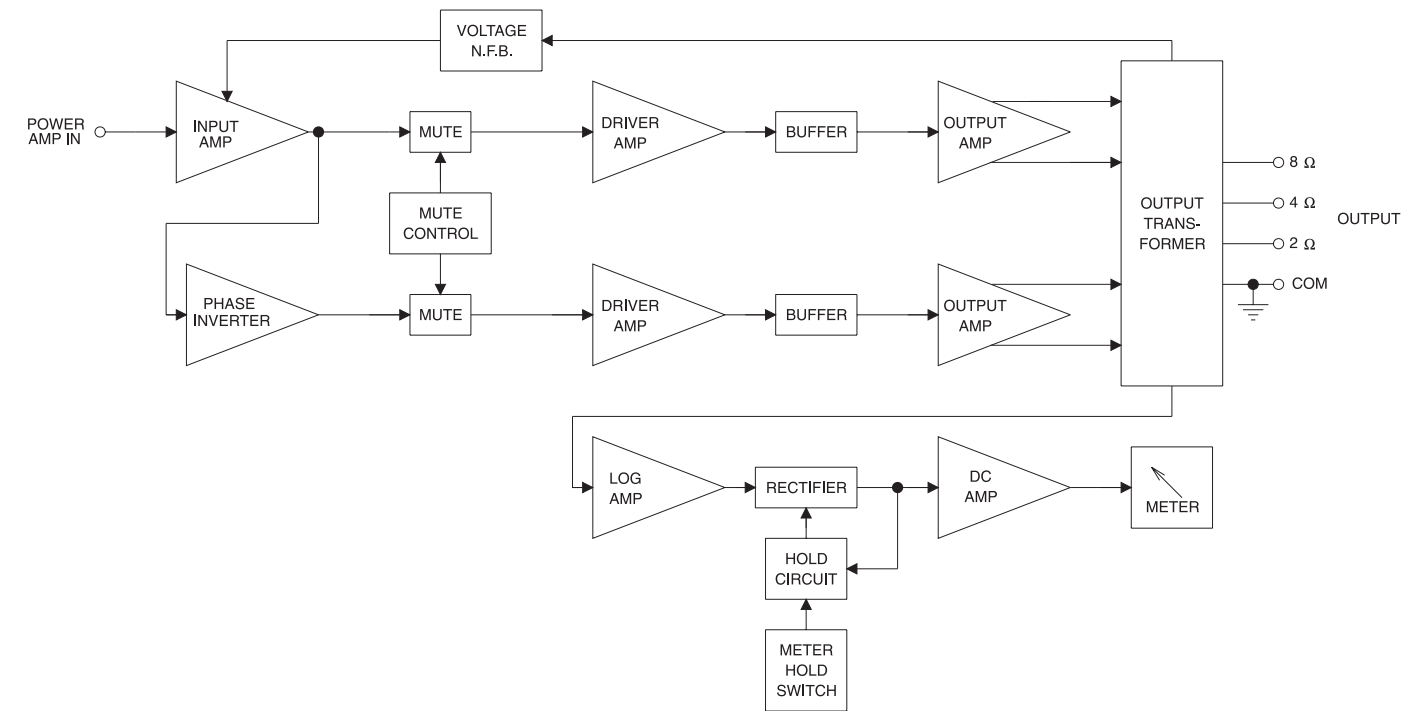
BOTTOM VIEW WITH COVER REMOVED

# BLOCK DIAGRAM

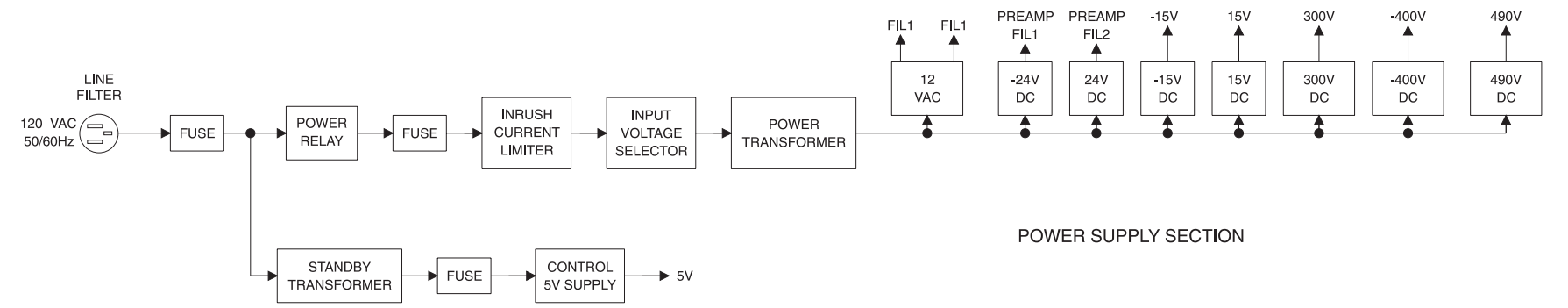
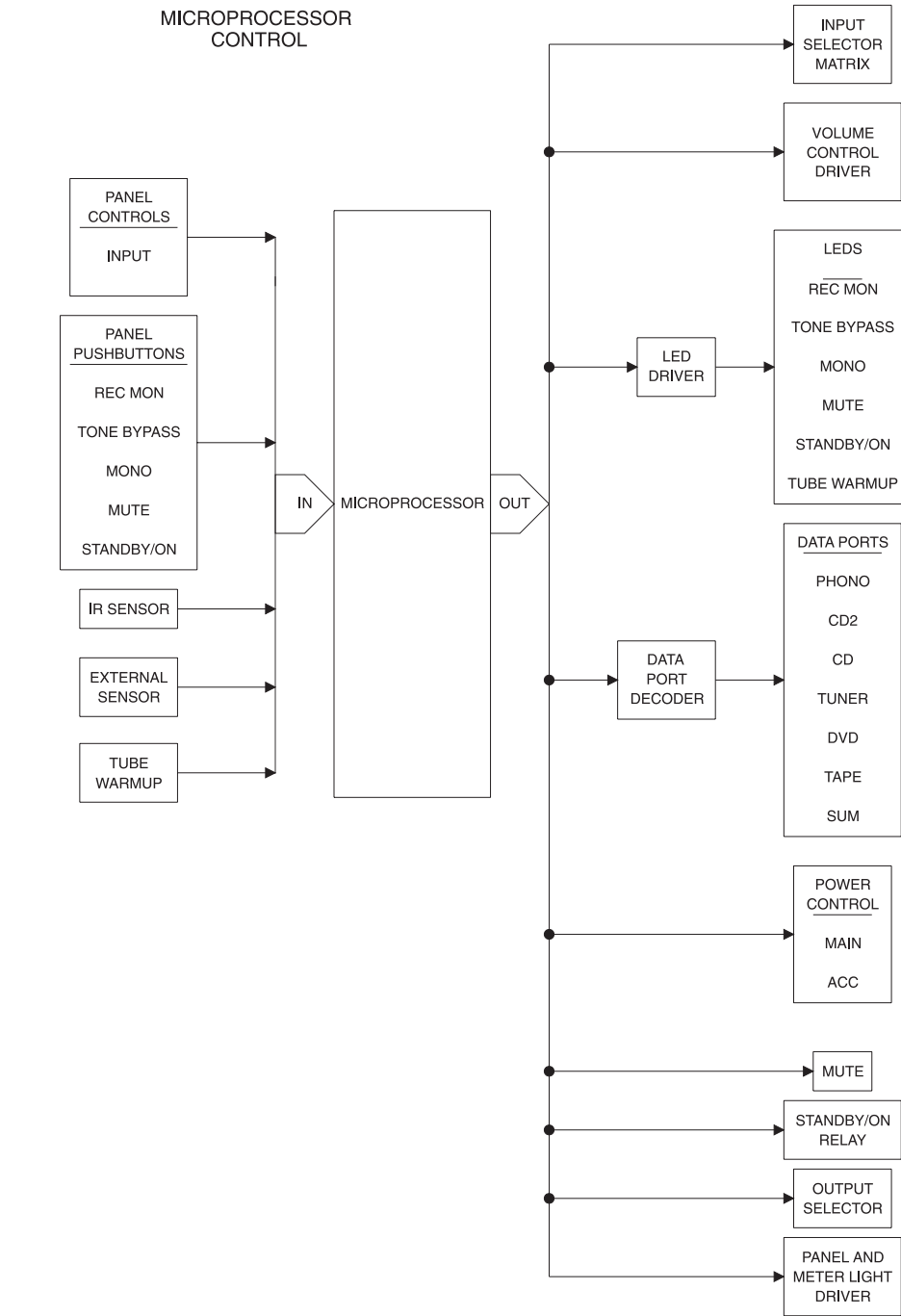
MA2275



AMPLIFIER SECTION ONE CHANNEL SHOWN

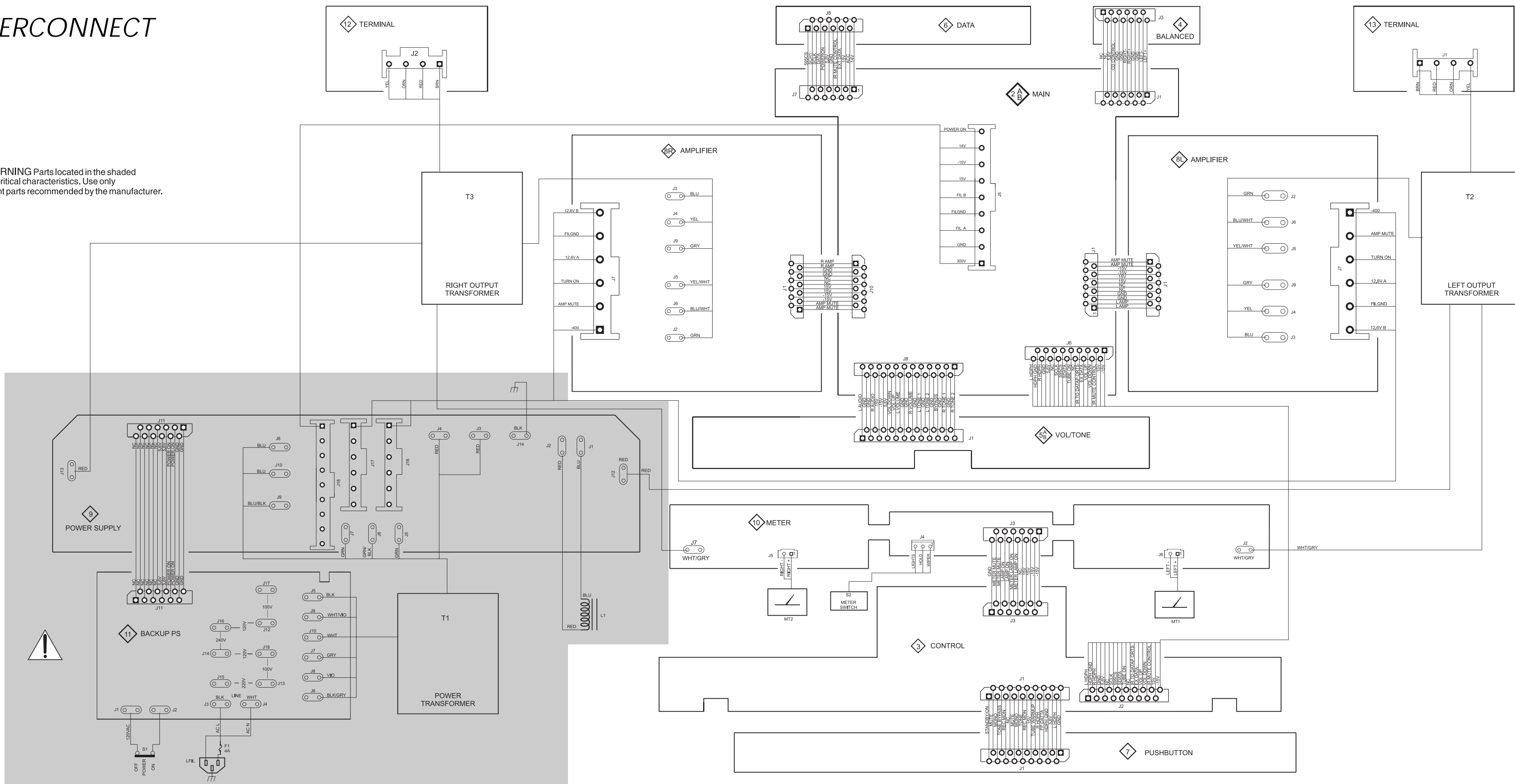


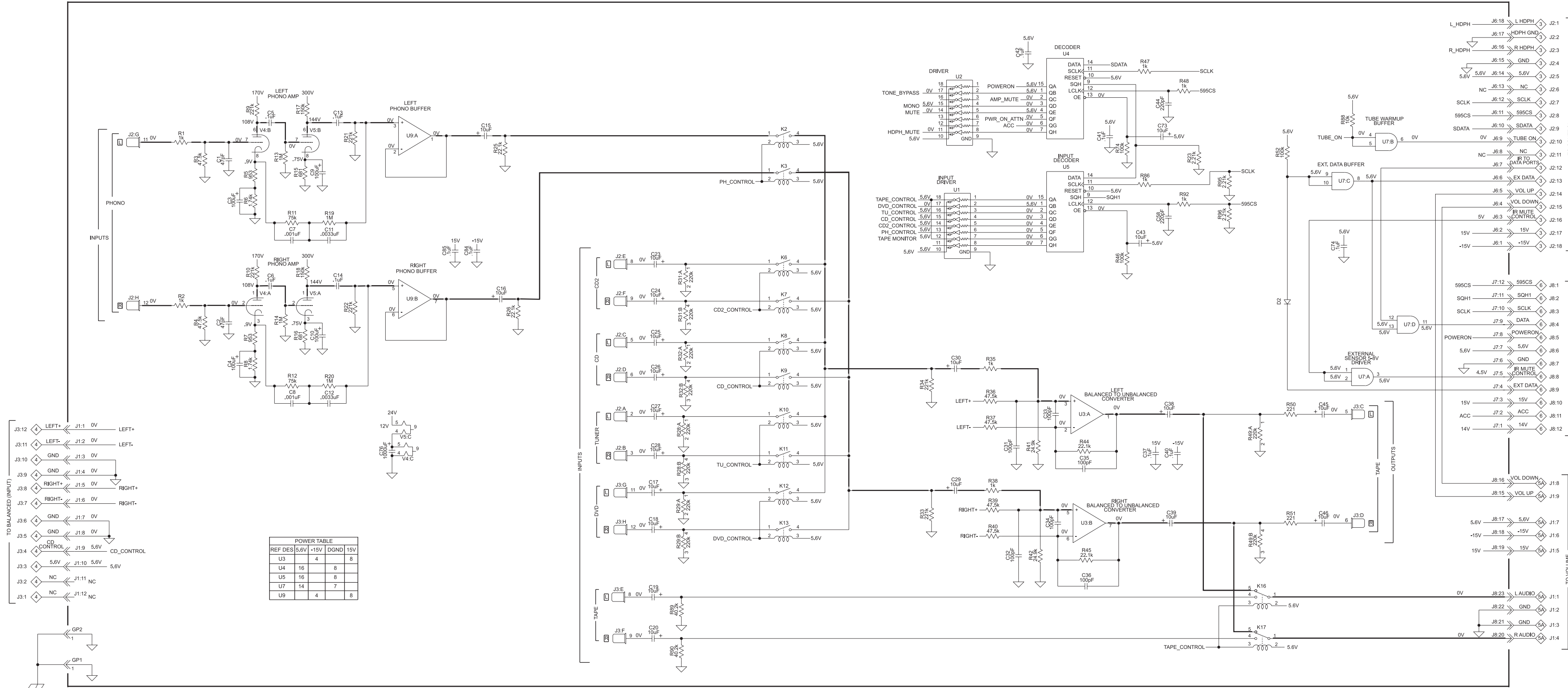
MICROPROCESSOR CONTROL

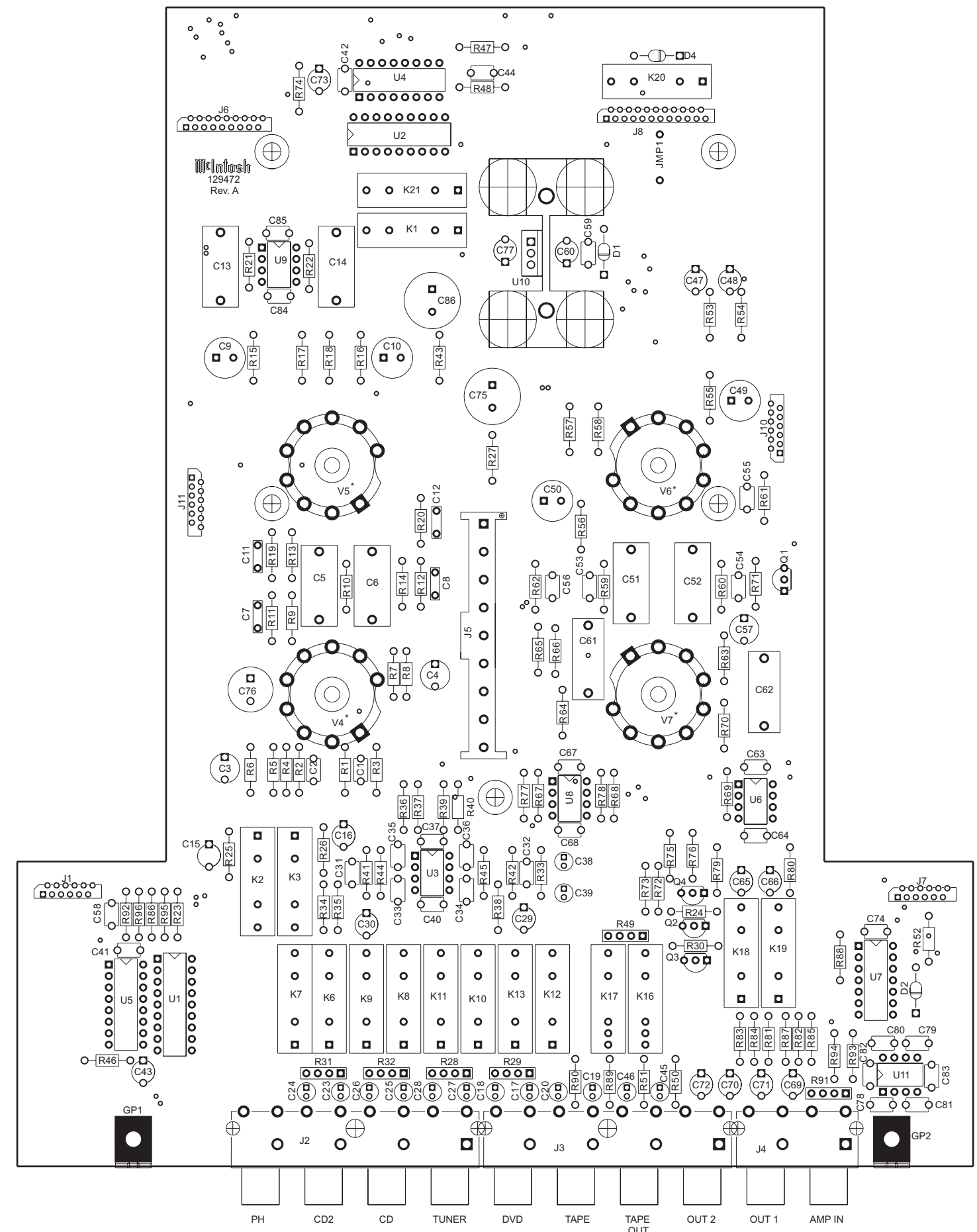
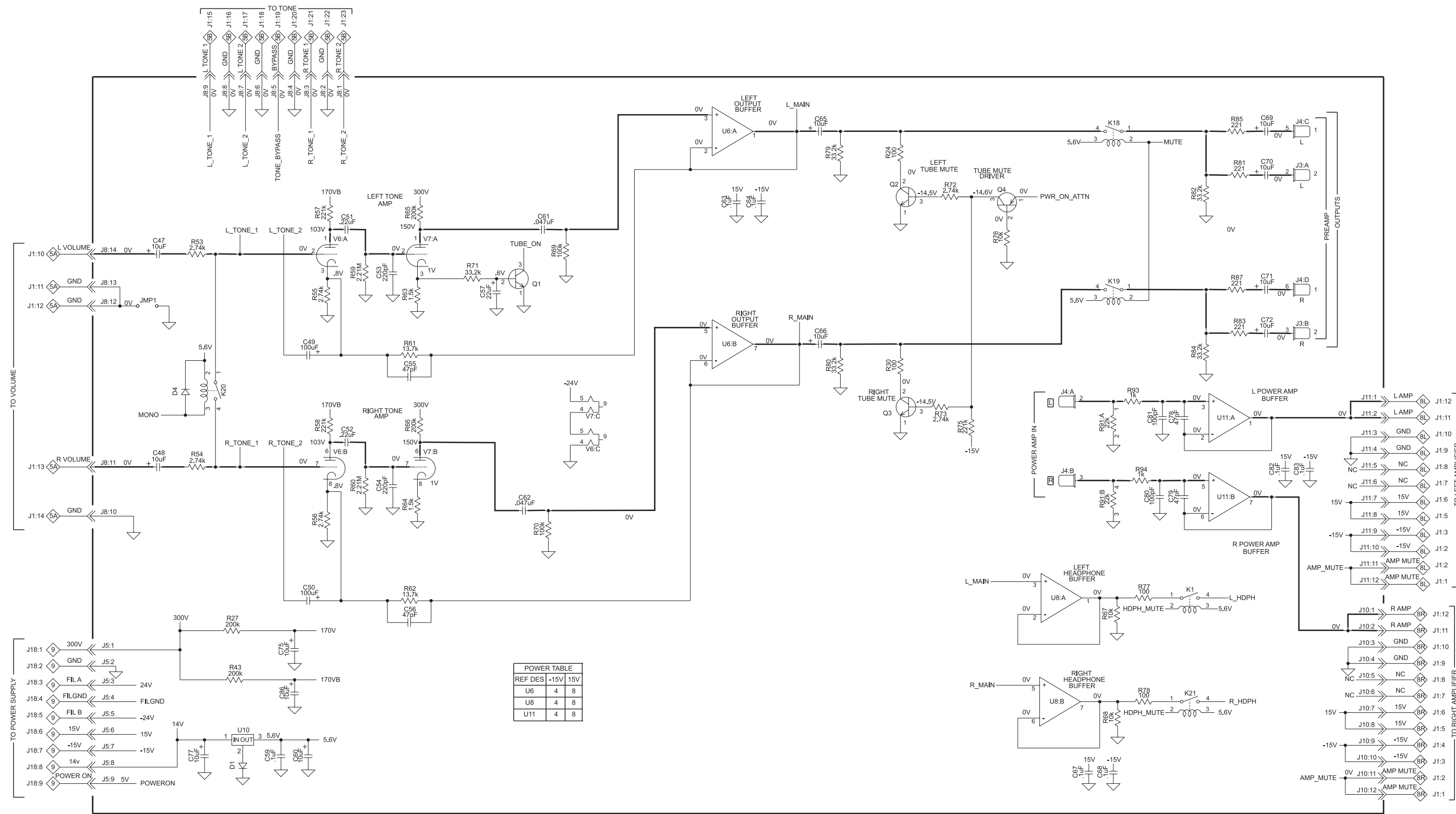


# 1 INTERCONNECT

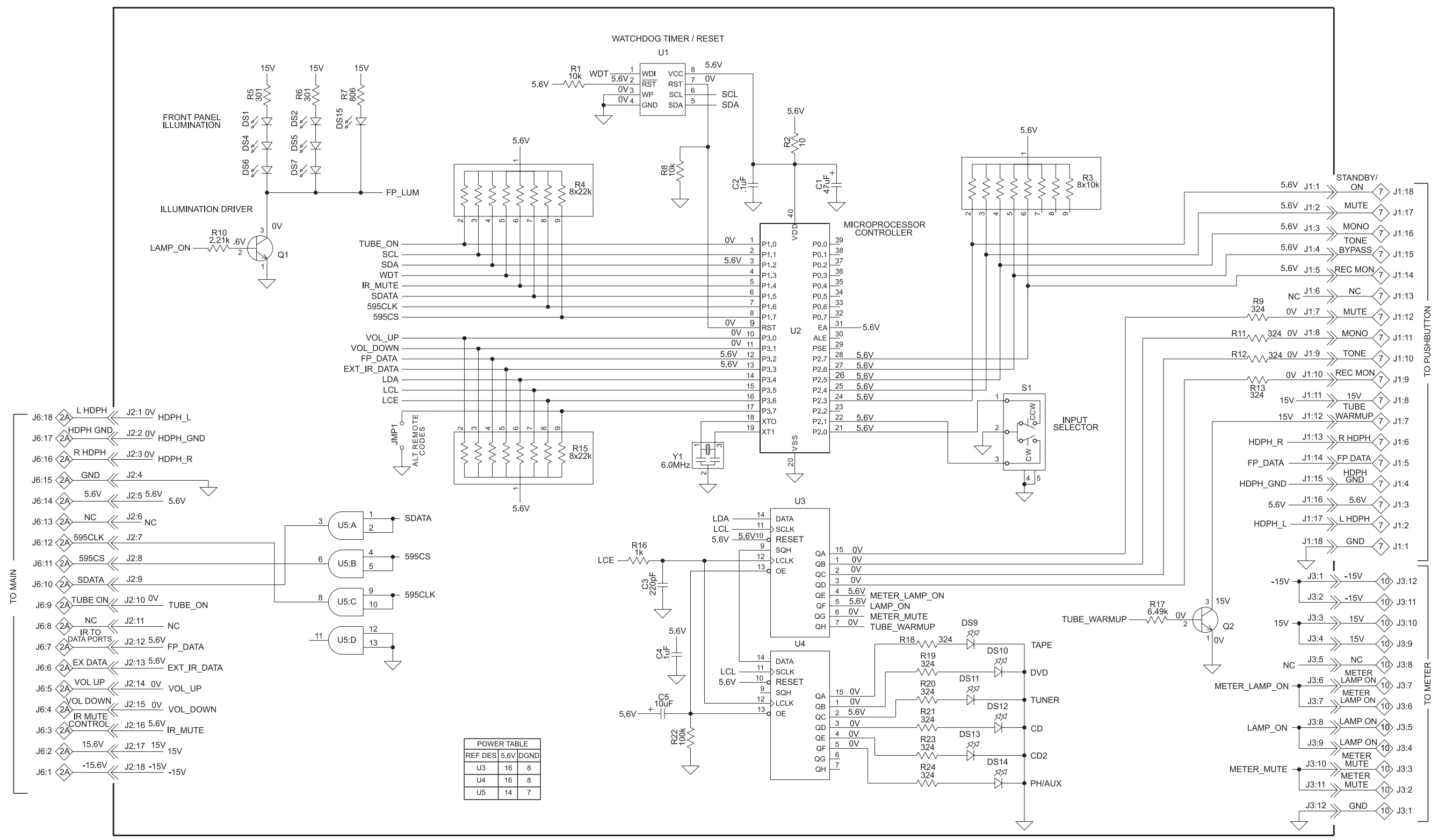
**!** WARNING Parts located in the shaded area have critical characteristics. Use only replacement parts recommended by the manufacturer.



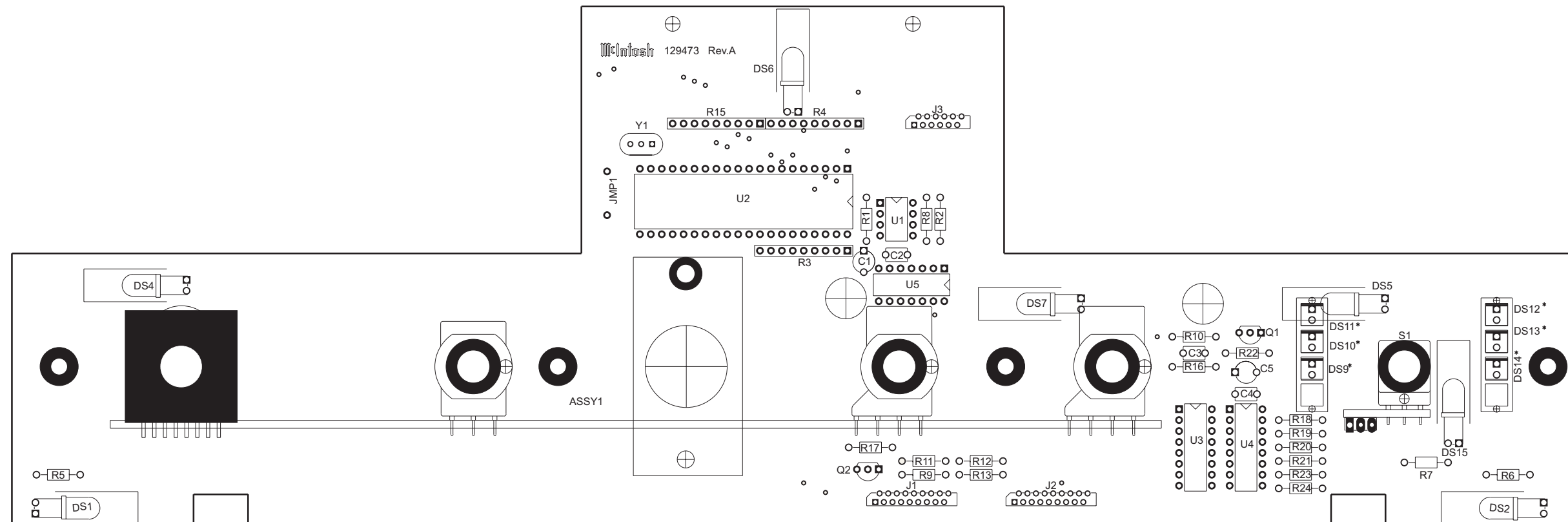




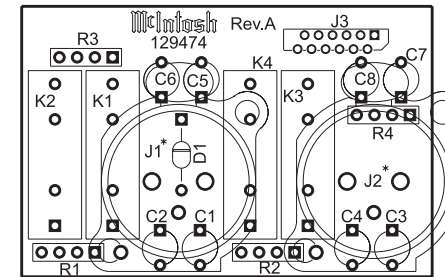
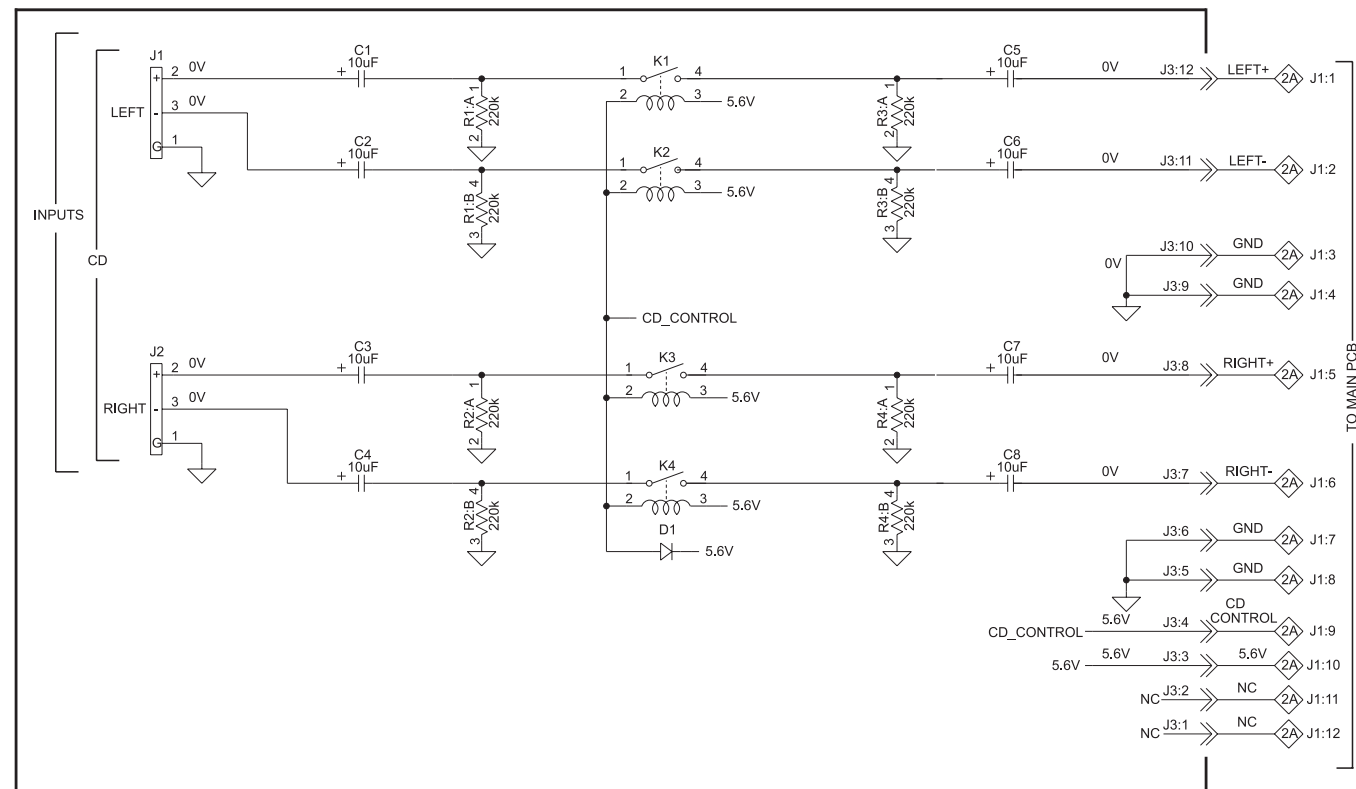




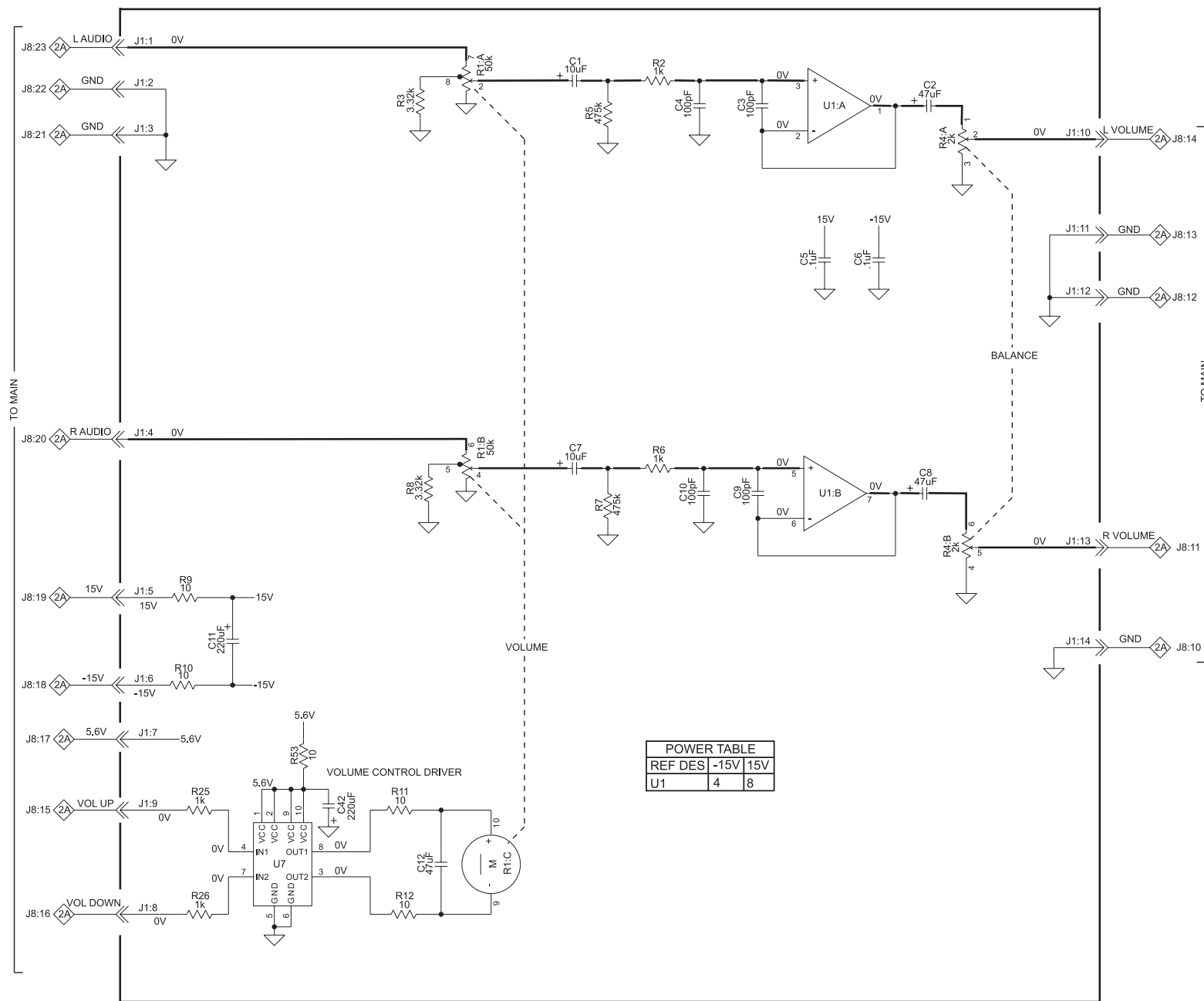
**3** CONTROL 049966



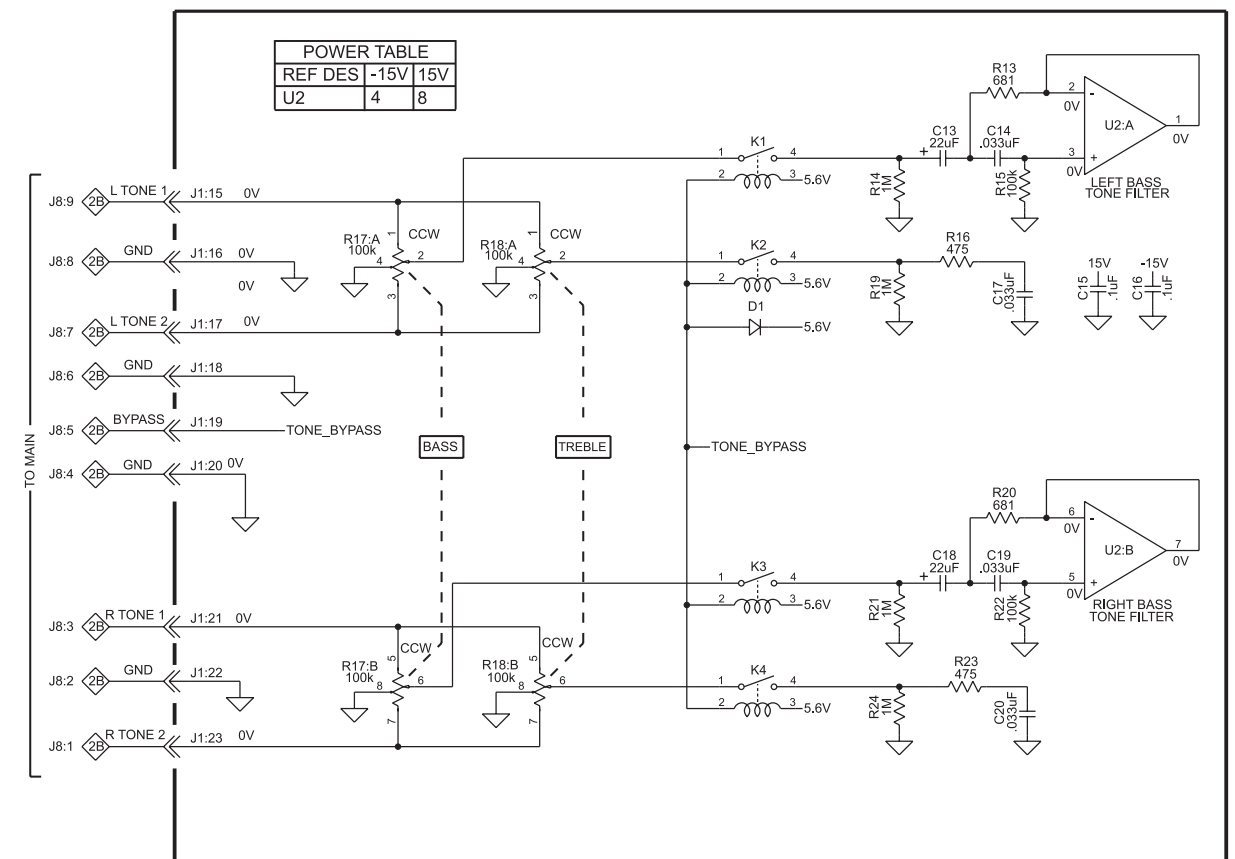
**4** *BALANCED* 049967



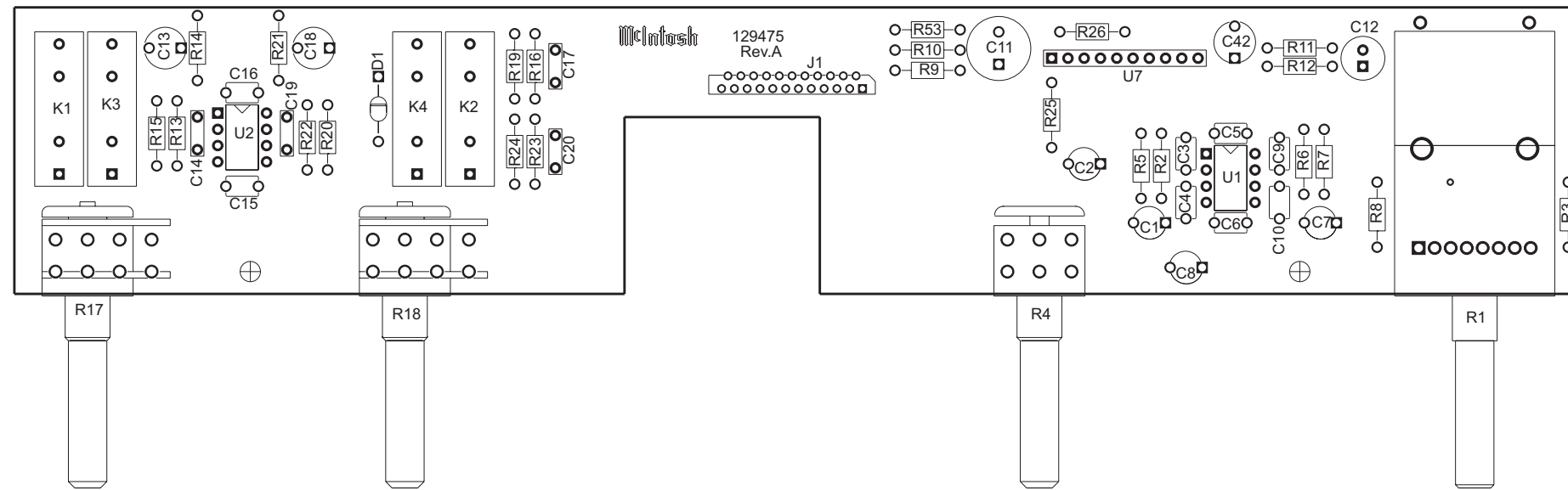
# 5A VOLUME/TONE 049968



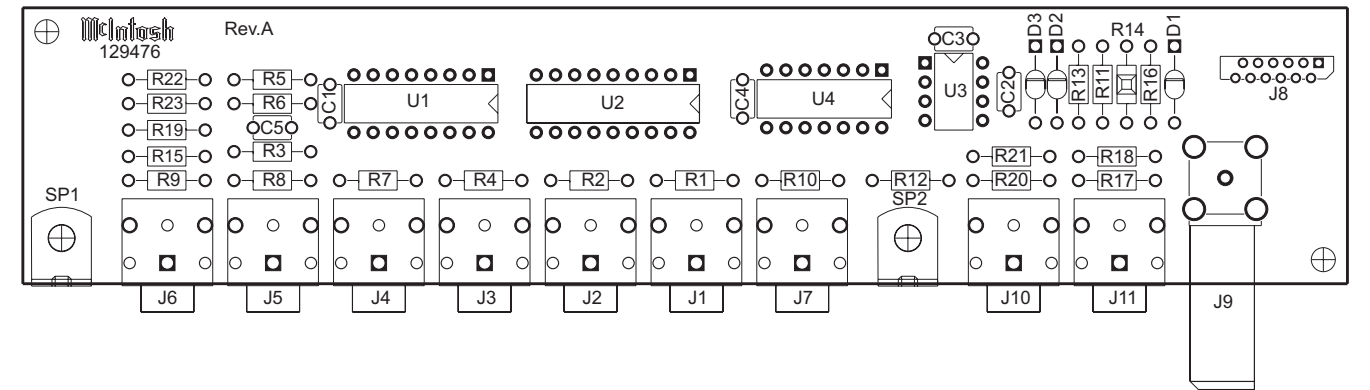
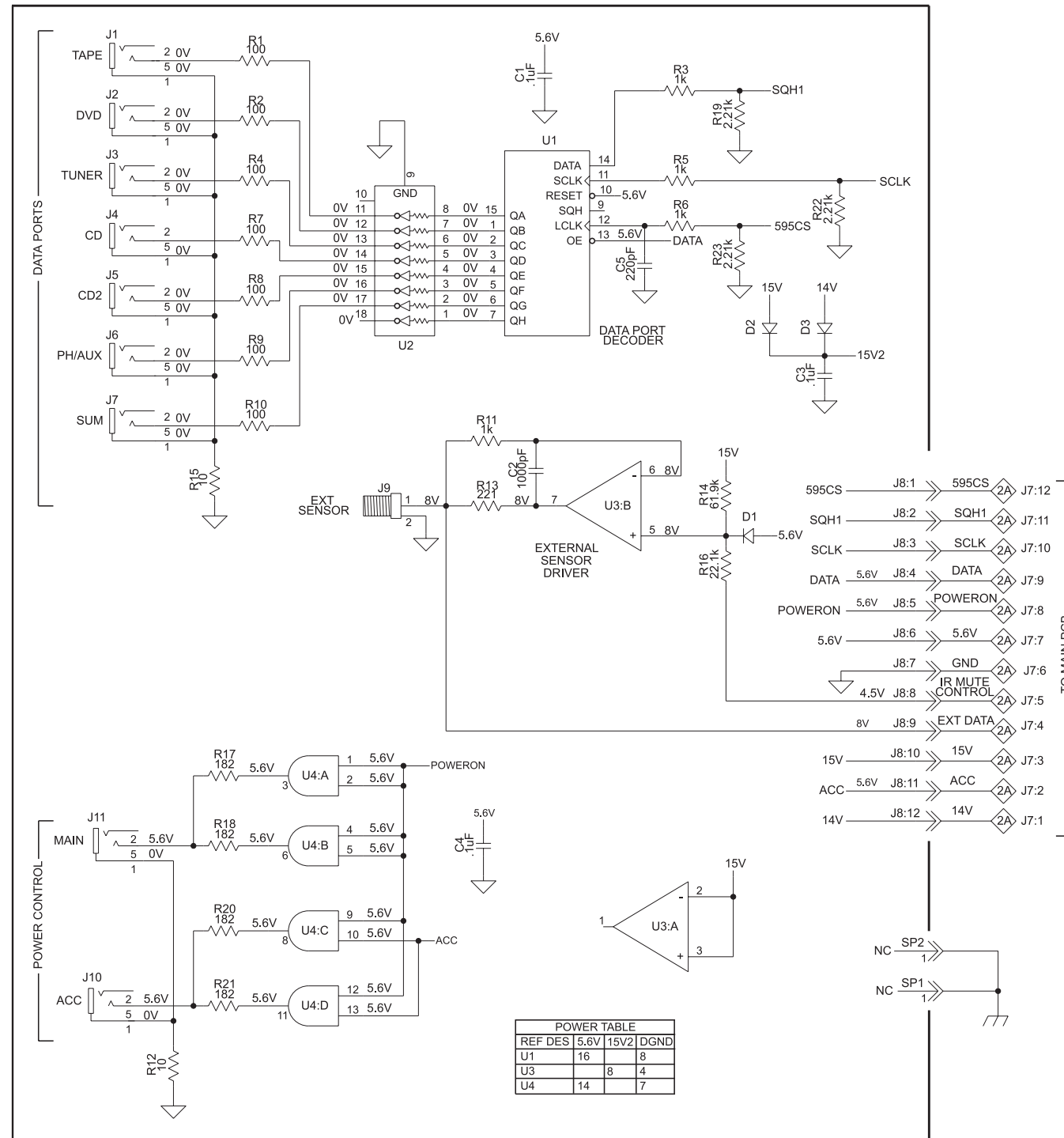
# 5B VOLUME/TONE 049968



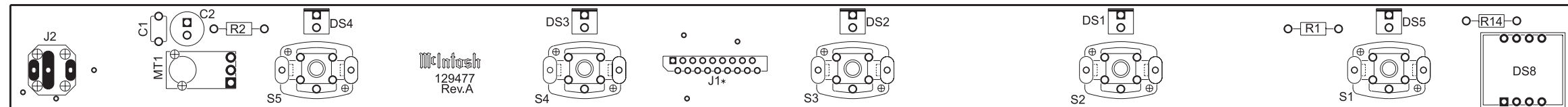
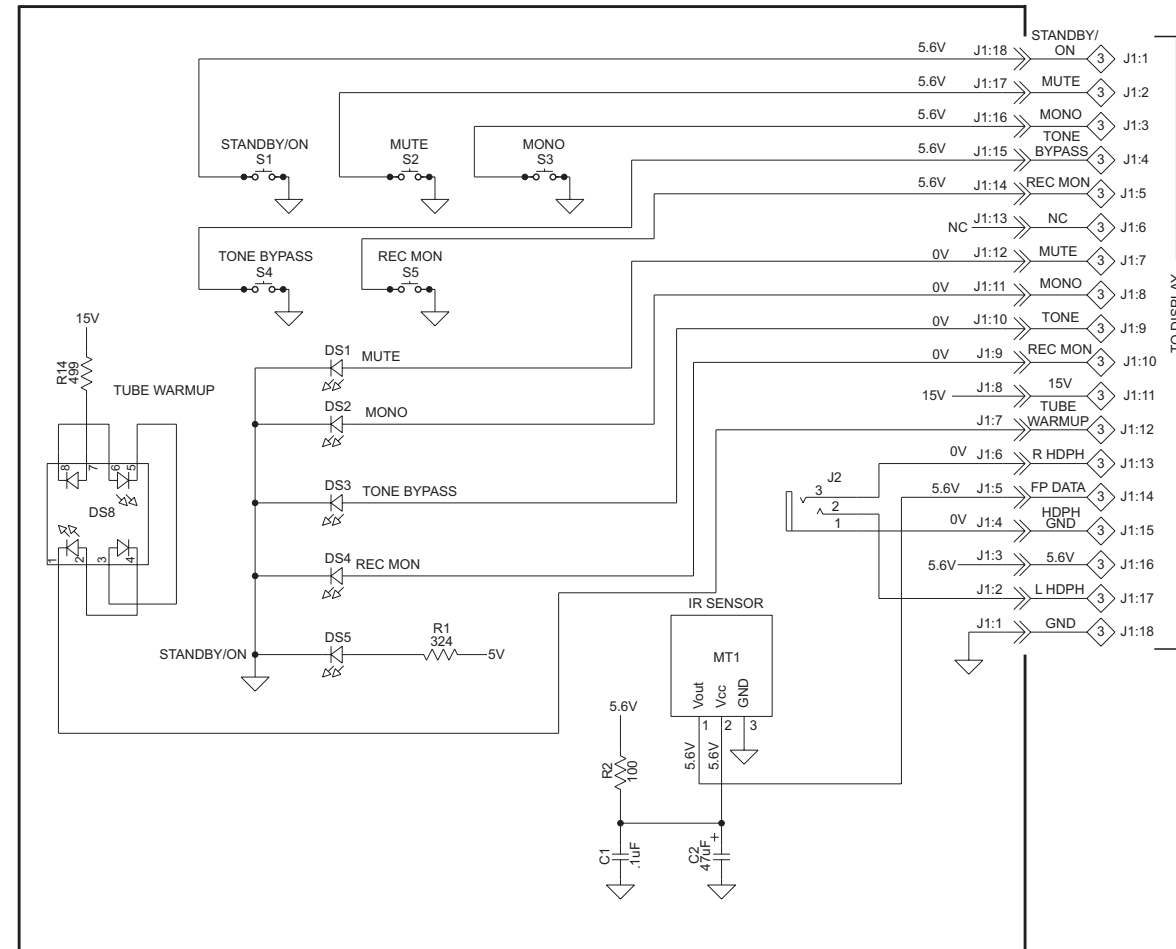
5 VOLUME/TONE 049968



# 6 DATA 049969

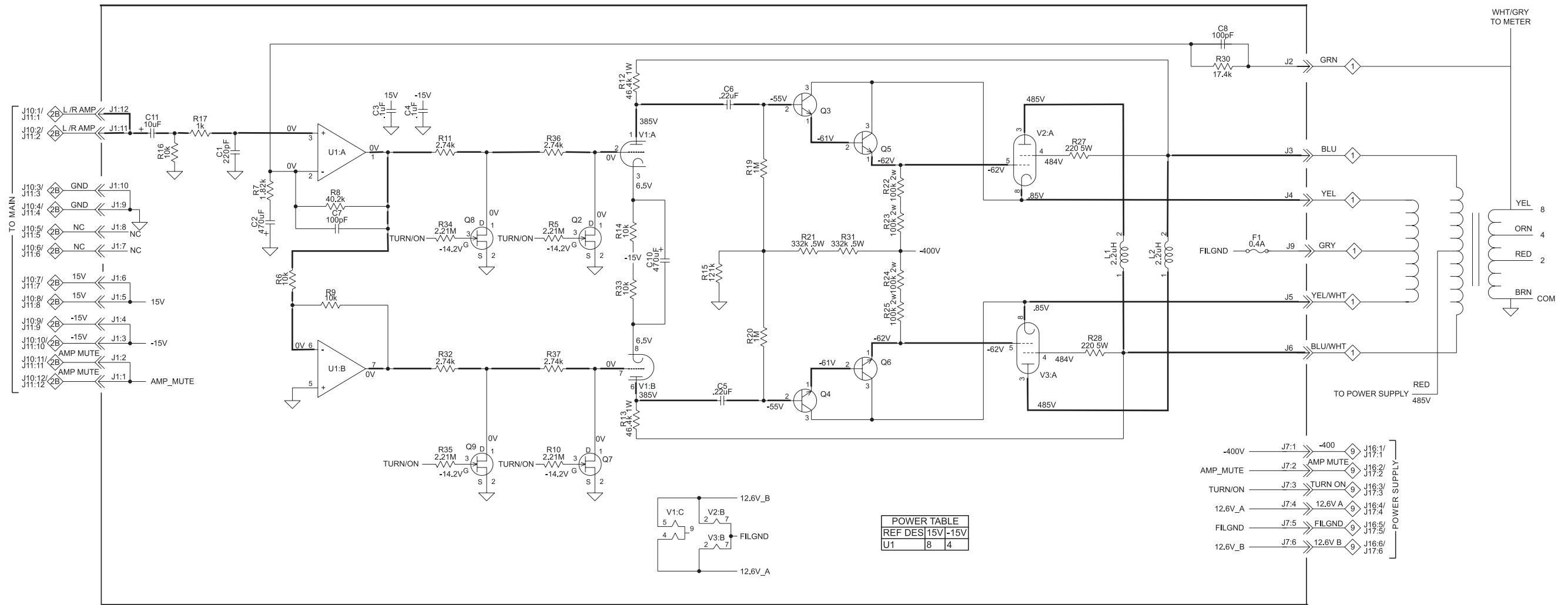


**7** *PUSHBUTTON* 049970





# AMPLIFIER 049971

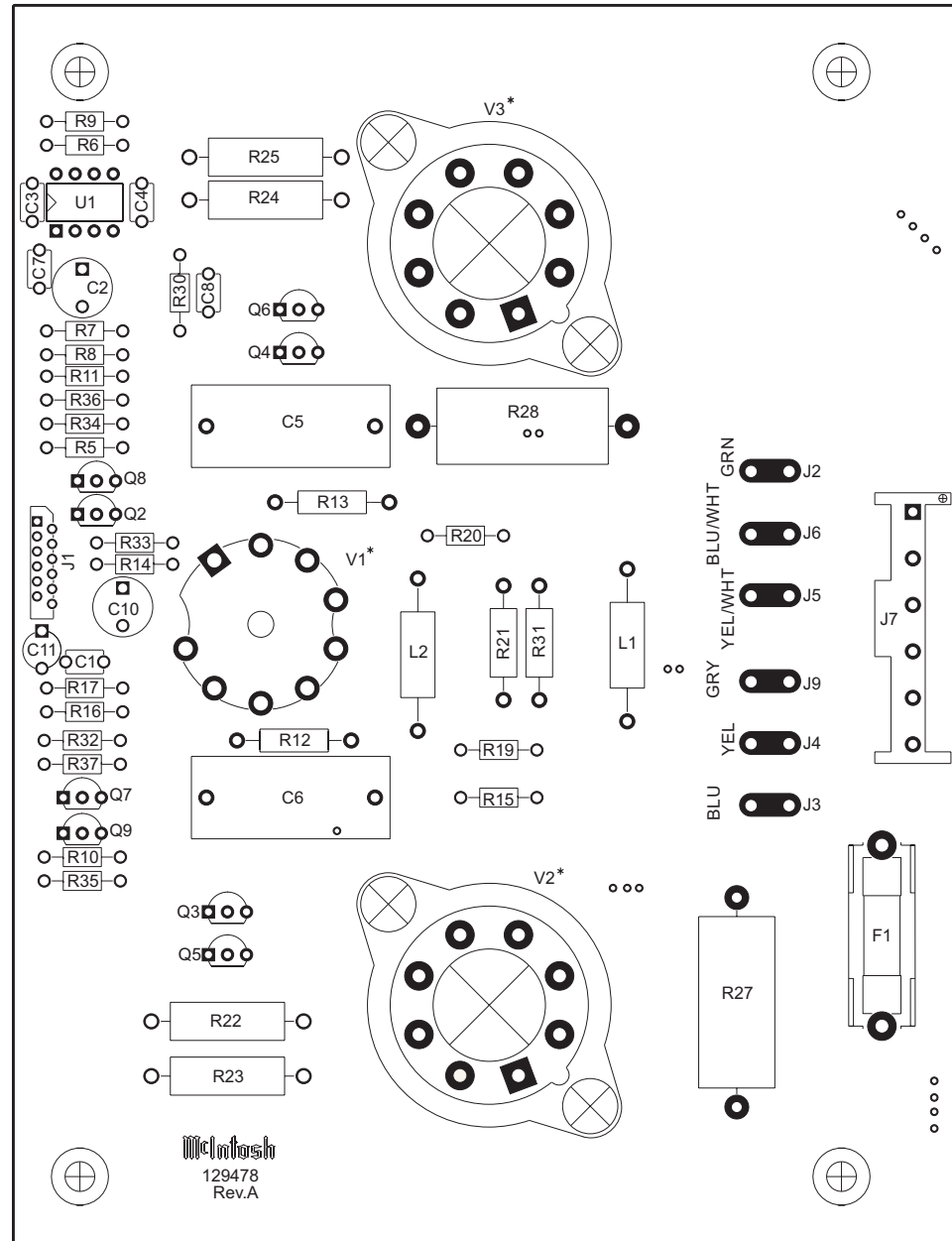


| POWER TABLE |     |      |
|-------------|-----|------|
| REF DES     | 15V | -15V |
| U1          | 8   | 4    |

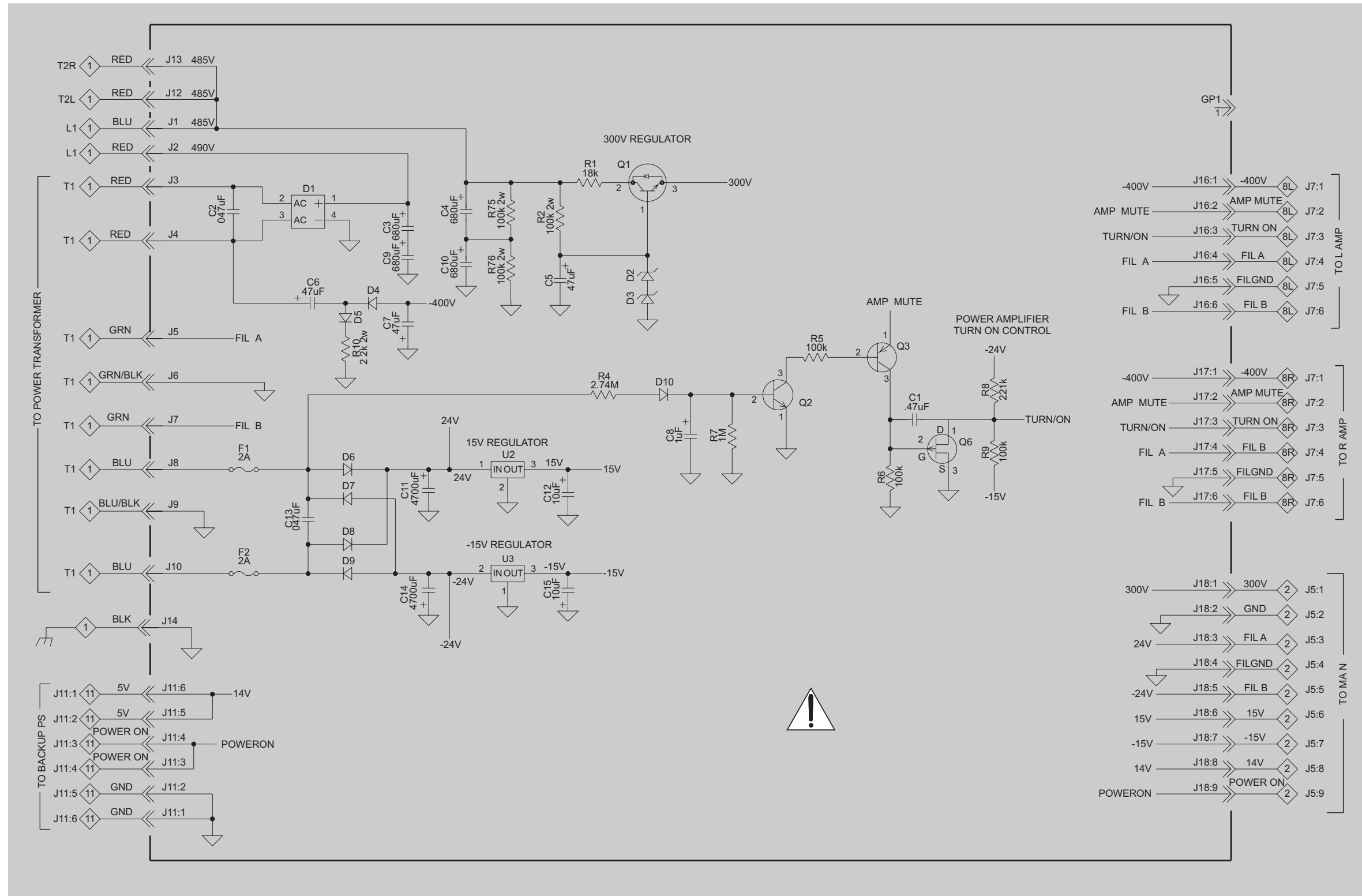
| POWER SUPPLY |      |              |
|--------------|------|--------------|
| -400V        | J7:1 | J16:1/ J17:1 |
| AMP_MUTE     | J7:2 | J16:2/ J17:2 |
| TURN/ON      | J7:3 | J16:3/ J17:3 |
| 12.6V_A      | J7:4 | J16:4/ J17:4 |
| FILGND       | J7:5 | J16:5/ J17:5 |
| 12.6V_B      | J7:6 | J16:6/ J17:6 |



8 AMPLIFIER 049971




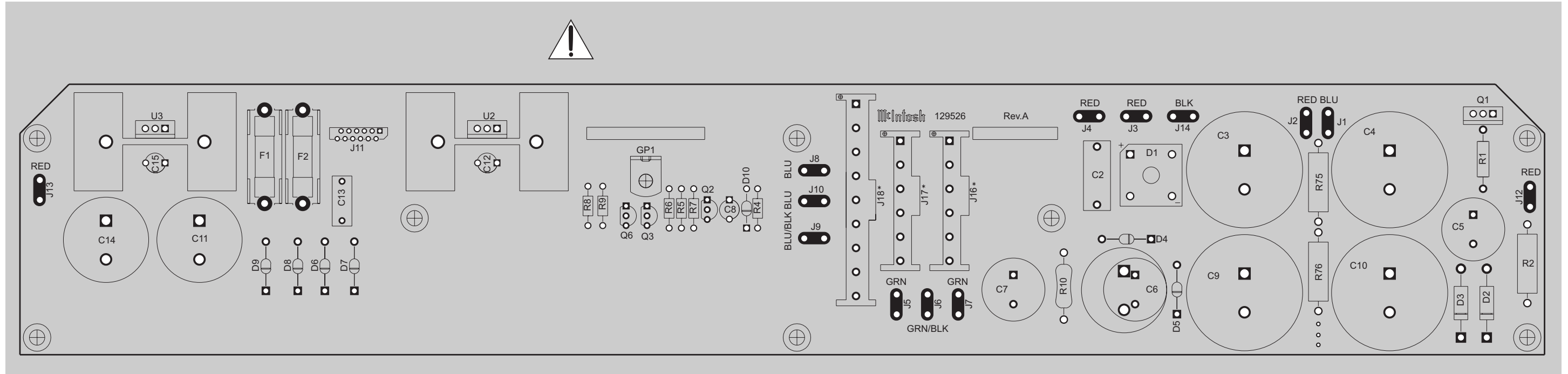
# 9 POWER SUPPLY 049972



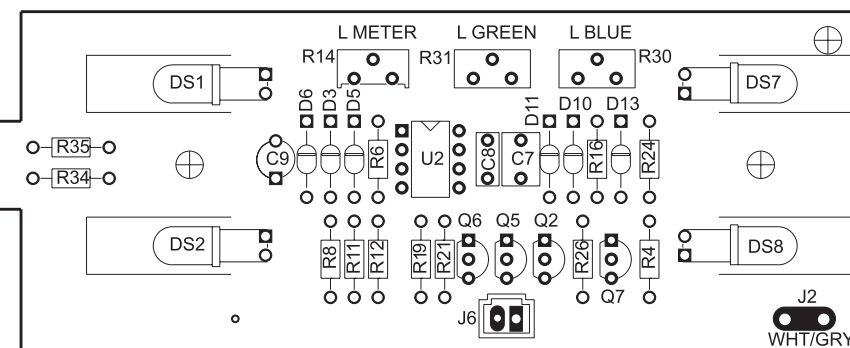
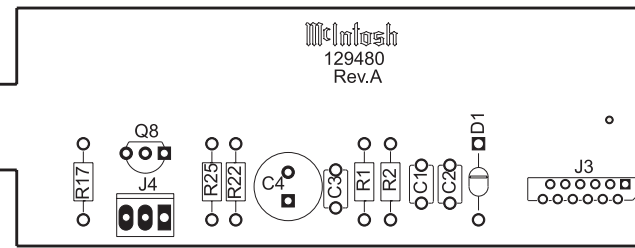
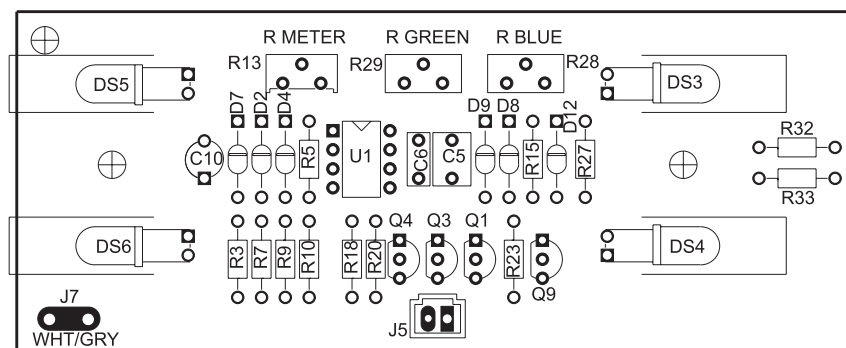
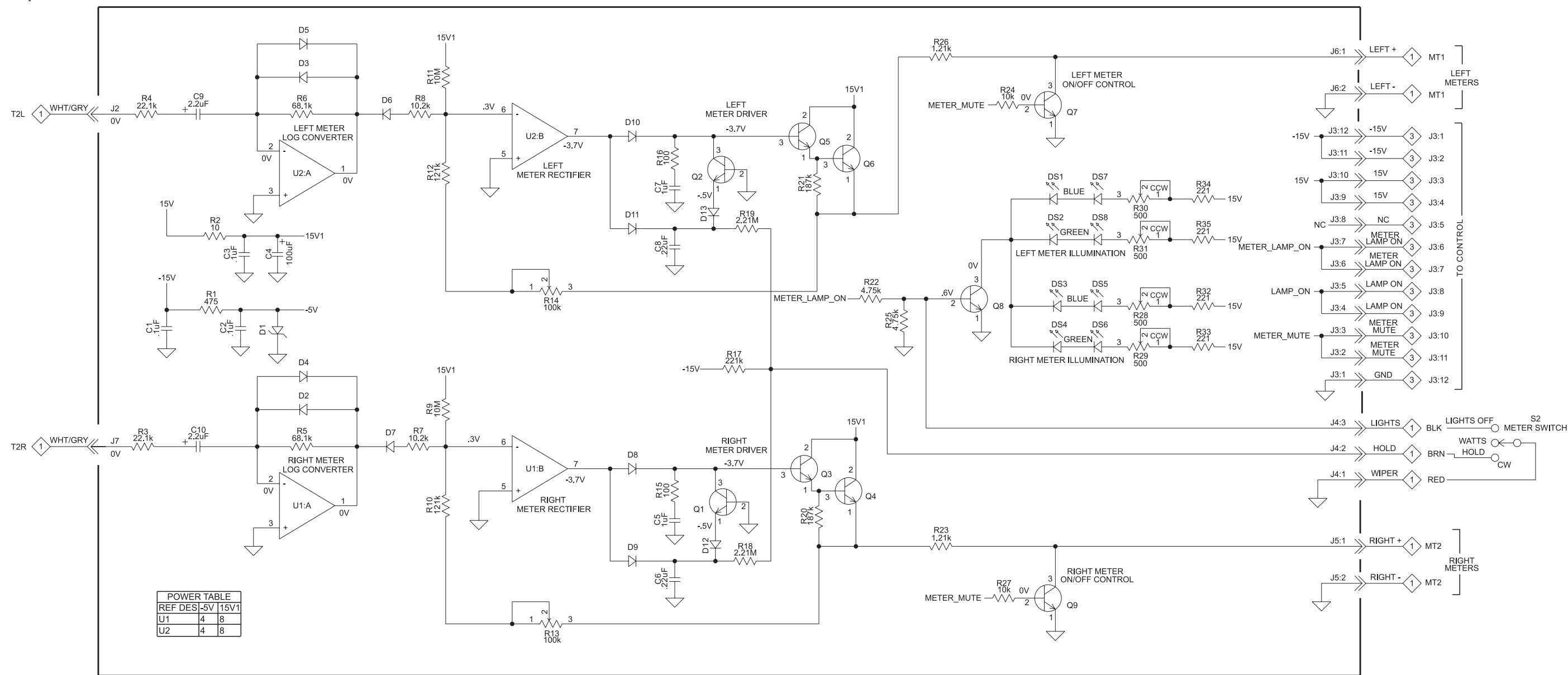
**!** WARNING Parts located in the shaded area have critical characteristics. Use only replacement parts recommended by the manufacturer.

9 POWER SUPPLY 049972

 **WARNING** Parts located in the shaded area have critical characteristics. Use only replacement parts recommended by the manufacturer.

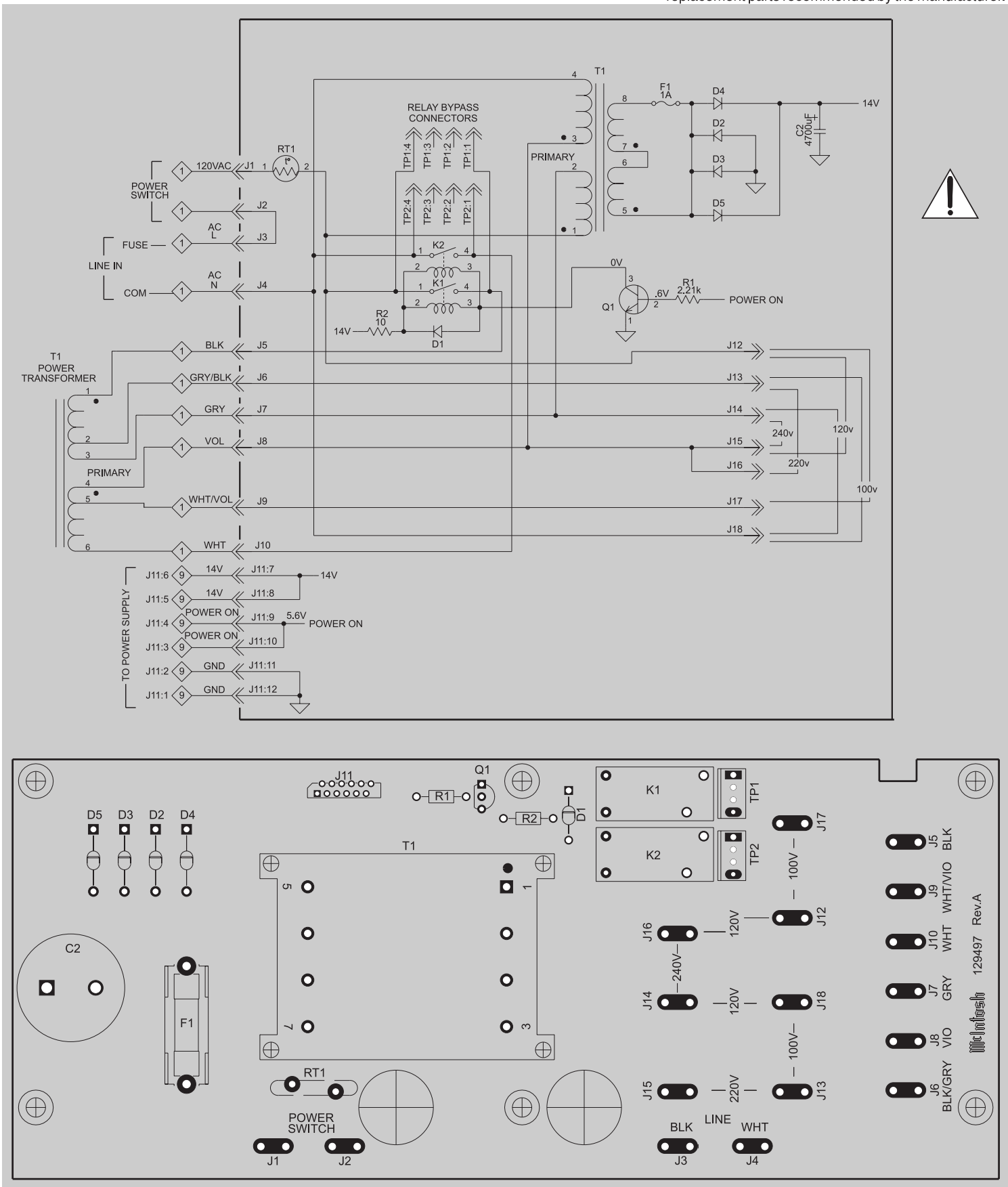


# 10 METER 049973

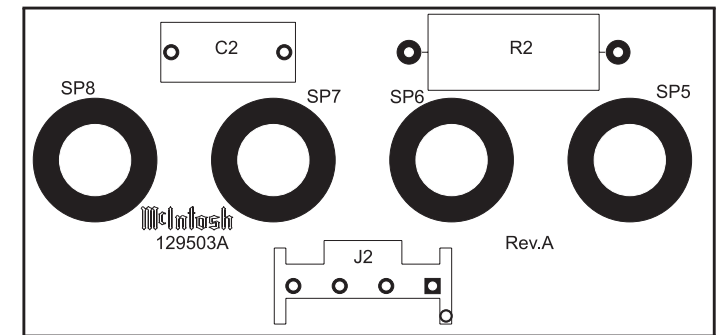
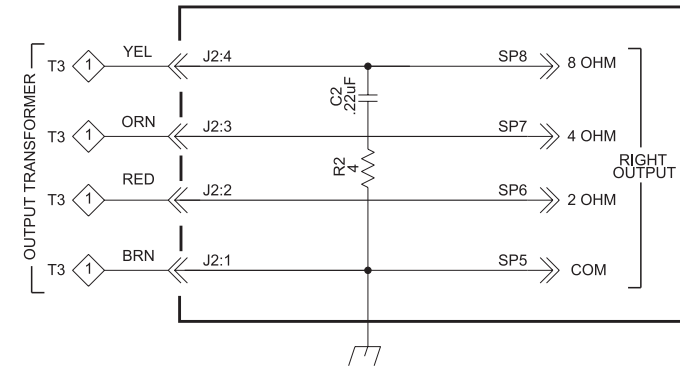


# 11 BACKUP PS 050007

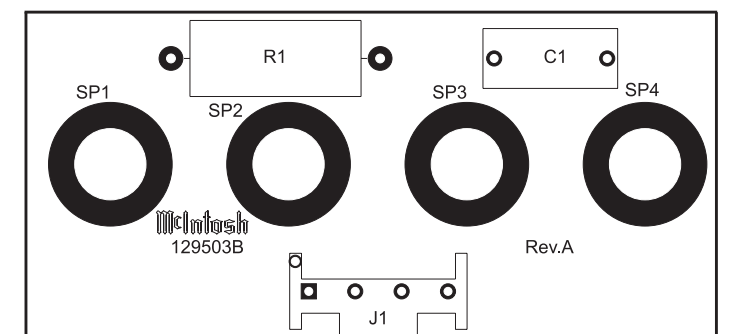
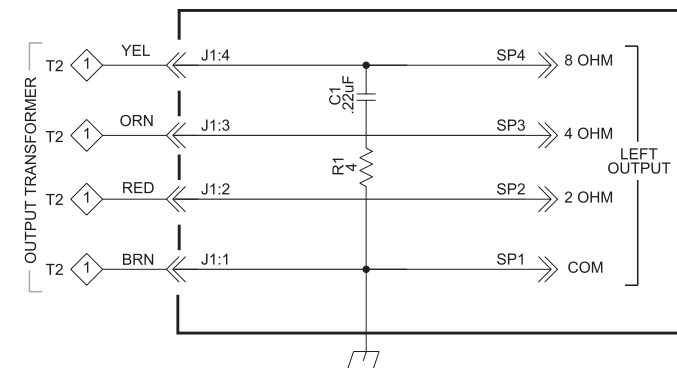
**!** WARNING Parts located in the shaded area have critical characteristics. Use only replacement parts recommended by the manufacturer.



# 12 TERMINAL 050052



# 13 TERMINAL 050052



# PARTS LIST

| Ref. No. | Description                | Part No. |     |                                |        |     |                                |        |          |                                |        |
|----------|----------------------------|----------|-----|--------------------------------|--------|-----|--------------------------------|--------|----------|--------------------------------|--------|
| <b>1</b> | <b>INTERCONNECT</b>        |          |     |                                |        |     |                                |        |          |                                |        |
| L1       | CHOKE FILTER .5H           | 122379   | C54 | CAP MONO 220PF 100V 10% NPO    | 061301 | K20 | RELAY REED FORM 1A 5V 500 OHMS | 087050 | R58      | RES MF 221K 1% 1/4W            | 144421 |
| LFIL     | LINE FILTER                | 117755   | C55 | CAP MONO 47PF 200V 10% NPO     | 061299 | K21 | RELAY REED FORM 1A 5V 500 OHMS | 087050 | R59      | RES MF 2.21M 1/4W              | 144265 |
| MT1      | METER                      | 124087   | C56 | CAP MONO 47PF 200V 10% NPO     | 061299 | Q1  | TRANSISTOR NPN                 | 132223 | R60      | RES MF 2.21M 1/4W              | 144265 |
| MT2      | METER                      | 124087   | C57 | CAP ELECT 22UF 100V            | 066506 | Q2  | TRANSISTOR NPN                 | 132257 | R61      | RES MF 13.7K 1% 1/4W           | 144342 |
| S1       | POWER SWITCH               | 171026   | C58 | CAP MONO 220PF 100V 10% NPO    | 061301 | Q3  | TRANSISTOR NPN                 | 132257 | R62      | RES MF 13.7K 1% 1/4W           | 144342 |
| S2       | SWITCH                     | 146243   | C59 | CAP MONO .1uF 50V 20% Z5U      | 061305 | Q4  | TRANSISTOR PNP                 | 132224 | R63      | RES MF 1.5K 1% 1/4W            | 144128 |
| T1       | POTTED TRANSFORMER, POWER  | 050041   | C60 | CAP ELECT 10UF 50V             | 066445 | R1  | RES MF 1K 1% 1/4W              | 144090 | R64      | RES MF 1.5K 1% 1/4W            | 144128 |
| T2       | POTTED TRANSFORMER, OUTPUT | 050042   | C61 | CAP POLY .047UF 10% 1000VDC    | 064434 | R2  | RES MF 1K 1% 1/4W              | 144090 | R65      | RES MF 200K 1% 1/4W            | 144117 |
| T3       | POTTED TRANSFORMER, OUTPUT | 050042   | C62 | CAP POLY .047UF 10% 1000VDC    | 064434 | R3  | RES MF 47.5K 1% 1/4W           | 144108 | R66      | RES MF 200K 1% 1/4W            | 144117 |
|          |                            |          | C63 | CAP MONO .1uF 50V 20% Z5U      | 061305 | R4  | RES MF 47.5K 1% 1/4W           | 144108 | R67      | RES MF 10K 1% 1/4W             | 144053 |
|          |                            |          | C64 | CAP MONO .1uF 50V 20% Z5U      | 061305 | R5  | RES MF 953 OHM 1/4W 1%         | 144473 | R68      | RES MF 10K 1% 1/4W             | 144053 |
|          |                            |          | C65 | CAP ELECT 10UF 50V             | 066445 | R6  | RES MF 1.74K 1% 1/4W           | 144351 | R69      | RES MF 100K 1% 1/4W            | 144113 |
|          |                            |          | C66 | CAP ELECT 10UF 50V             | 066445 | R7  | RES MF 953 OHM 1/4W 1%         | 144473 | R70      | RES MF 100K 1% 1/4W            | 144113 |
|          |                            |          | C67 | CAP MONO .1uF 50V 20% Z5U      | 061305 | R8  | RES MF 1.74K 1% 1/4W           | 144351 | R71      | RES MF 33.2K 1% 1/4W           | 144015 |
|          |                            |          | C68 | CAP MONO .1uF 50V 20% Z5U      | 061305 | R9  | RES MF 221K 1% 1/4W            | 144421 | R72      | RES MF 2.74K 1% 1/4W           | 144304 |
|          |                            |          | C69 | CAP ELECT 10uF 50V             | 066445 | R10 | RES MF 221K 1% 1/4W            | 144421 | R73      | RES MF 2.74K 1% 1/4W           | 144304 |
|          |                            |          | C70 | CAP ELECT 10uF 50V             | 066445 | R11 | RES MF 75K 1% 1/4W             | 144156 | R74      | RES MF 100K 1% 1/4W            | 144113 |
|          |                            |          | C71 | CAP ELECT 10uF 50V             | 066445 | R12 | RES MF 75K 1% 1/4W             | 144156 | R75      | RES MF 221K 1% 1/4W            | 144421 |
|          |                            |          | C72 | CAP ELECT 10uF 50V             | 066445 | R13 | RES MF 1M 1/4W                 | 144269 | R76      | RES MF 10K 1% 1/4W             | 144053 |
|          |                            |          | C73 | CAP ELECT 10UF 50V             | 066445 | R14 | RES MF 1M 1/4W                 | 144269 | R77      | RES MF 100 OHM 1% 1/4W         | 144196 |
|          |                            |          | C74 | CAP MONO .1uF 50V 20% Z5U      | 061305 | R15 | RES MF 681 OHM 1% 1/4W         | 144195 | R78      | RES MF 100 OHM 1% 1/4W         | 144196 |
|          |                            |          | C75 | CAP ELECT 10UF 250V            | 066493 | R16 | RES MF 681 OHM 1% 1/4W         | 144195 | R79      | RES MF 33.2K 1% 1/4W           | 144015 |
|          |                            |          | C76 | CAP ELECT 1000UF 25V           | 066513 | R17 | RES MF 150K 1% 1/4W            | 144419 | R80      | RES MF 33.2K 1% 1/4W           | 144015 |
|          |                            |          | C77 | CAP ELECT 10UF 50V             | 066445 | R18 | RES MF 150K 1% 1/4W            | 144419 | R81      | RES MF 221 OHM 1% 1/4W         | 144172 |
|          |                            |          | C78 | CAP MONO 47PF 200V 10% NPO     | 061299 | R19 | RES MF 1M 1/4W                 | 144269 | R82      | RES MF 33.2K 1% 1/4W           | 144015 |
|          |                            |          | C79 | CAP MONO 47PF 200V 10% NPO     | 061299 | R20 | RES MF 1M 1/4W                 | 144269 | R83      | RES MF 221 OHM 1% 1/4W         | 144172 |
|          |                            |          | C80 | CAP MONO 100PF 100V 10% NPO    | 061300 | R21 | RES MF 221K 1% 1/4W            | 144421 | R84      | RES MF 33.2K 1% 1/4W           | 144015 |
|          |                            |          | C81 | CAP MONO 100PF 100V 10% NPO    | 061300 | R22 | RES MF 221K 1% 1/4W            | 144421 | R85      | RES MF 221 OHM 1% 1/4W         | 144172 |
|          |                            |          | C82 | CAP MONO .1uF 50V 20% Z5U      | 061305 | R23 | RES MF 2.21K 1% 1/4W           | 144298 | R86      | RES MF 1K 1% 1/4W              | 144090 |
|          |                            |          | C83 | CAP MONO .1uF 50V 20% Z5U      | 061305 | R24 | RES MF 100 OHM 1% 1/4W         | 144196 | R87      | RES MF 221 OHM 1% 1/4W         | 144172 |
|          |                            |          | C84 | CAP MONO .1uF 50V 20% Z5U      | 061305 | R25 | RES MF 22.1K 1% 1/4W           | 144187 | R88      | RES MF 10K 1% 1/4W             | 144053 |
|          |                            |          | C85 | CAP MONO .1uF 50V 20% Z5U      | 061305 | R26 | RES MF 22.1K 1% 1/4W           | 144187 | R89      | RES MF 40.2K 1% 1/4W           | 144107 |
|          |                            |          | C86 | CAP ELECT 10UF 250V            | 066493 | R27 | RES MF 200K 1% 1/4W            | 144117 | R90      | RES MF 40.2K 1% 1/4W           | 144107 |
|          |                            |          | D1  | DIODE SILICON                  | 070047 | R28 | RES NETWORK 2X220K ISO         | 144262 | R91      | RES MF 4.75 MEG 1% 1/2W        | 144366 |
|          |                            |          | D2  | DIODE SILICON                  | 070047 | R29 | RES NETWORK 2X220K ISO         | 144262 | R92      | RES MF 1K 1% 1/4W              | 144090 |
|          |                            |          | D4  | DIODE SILICON                  | 070047 | R30 | RES MF 100 OHM 1% 1/4W         | 144196 | R93      | RES MF 1K 1% 1/4W              | 144090 |
|          |                            |          | GP1 | BRACKET PCB CARD MOUNTING      | 003611 | R31 | RES NETWORK 2X220K ISO         | 144262 | R94      | RES MF 1K 1% 1/4W              | 144090 |
|          |                            |          | GP2 | BRACKET PCB CARD MOUNTING      | 003611 | R32 | RES NETWORK 2X220K ISO         | 144262 | R95      | RES MF 2.21K 1% 1/4W           | 144298 |
|          |                            |          | J1  | CONN 12 PIN FFC                | 117720 | R33 | RES MF 221K 1% 1/4W            | 144421 | R96      | RES MF 2.21K 1% 1/4W           | 144298 |
|          |                            |          | J2  | JACK RCA 4X2 WHT/RED 14MM      | 117791 | R34 | RES MF 221K 1% 1/4W            | 144421 | U1       | IC OCTAL DARLNGTON TRANS ARRAY | 133258 |
|          |                            |          | J3  | JACK RCA 4X2 WHT/RED 14MM      | 117791 | R35 | RES MF 1K 1% 1/4W              | 144090 | U2       | IC OCTAL DARLNGTON TRANS ARRAY | 133258 |
|          |                            |          | J4  | JACK RCA 2X2 WHT/RED 14MM      | 117789 | R36 | RES MF 47.5K 1% 1/4W           | 144108 | U3       | IC DUAL OPERATIONAL AMPLIFIER  | 133260 |
|          |                            |          | J5  | HEADER 9 CIRCUIT POST NATURAL  | 117724 | R37 | RES MF 47.5K 1% 1/4W           | 144108 | U4       | IC SHFT REG SER-PAR            | 133186 |
|          |                            |          | J6  | CONN FFC 18PIN                 | 117765 | R38 | RES MF 1K 1% 1/4W              | 144090 | U5       | IC SHFT REG SER-PAR            | 133186 |
|          |                            |          | J7  | CONN 12 PIN FFC                | 117720 | R39 | RES MF 47.5K 1% 1/4W           | 144108 | U6       | IC DUAL OPERATIONAL AMPLIFIER  | 133260 |
|          |                            |          | J8  | CONN 23 PIN FFC                | 117715 | R40 | RES MF 47.5K 1% 1/4W           | 144108 | U7       | IC AND 2 INPUT X 4             | 133175 |
|          |                            |          | J10 | CONN 12 PIN FFC                | 117720 | R41 | RES MF 24.9K 1% 1/4W           | 144439 | U8       | IC DUAL OPERATIONAL AMPLIFIER  | 133260 |
|          |                            |          | J11 | CONN 12 PIN FFC                | 117720 | R42 | RES MF 24.9K 1% 1/4W           | 144439 | U9       | IC DUAL OPERATIONAL AMPLIFIER  | 133260 |
|          |                            |          | K1  | RELAY REED FORM 1A 5V 500 OHMS | 087050 | R43 | RES MF 200K 1% 1/4W            | 144117 | U10      | IC REGULATOR +5V               | 133108 |
|          |                            |          | K2  | RELAY REED FORM 1A 5V 500 OHMS | 087050 | R44 | RES MF 22.1K 1% 1/4W           | 144187 | U11      | IC DUAL OPERATIONAL AMPLIFIER  | 133260 |
|          |                            |          | K3  | RELAY REED FORM 1A 5V 500 OHMS | 087050 | R45 | RES MF 22.1K 1% 1/4W           | 144187 | V4       | TUBE 12AX7A MCINTOSH           | 165065 |
|          |                            |          | K6  | RELAY REED FORM 1A 5V 500 OHMS | 087050 | R46 | RES MF 100K 1% 1/4W            | 144113 | V5       | TUBE 12AX7A MCINTOSH           | 165065 |
|          |                            |          | K7  | RELAY REED FORM 1A 5V 500 OHMS | 087050 | R47 | RES MF 1K 1% 1/4W              | 144090 | V6       | TUBE 12AX7A MCINTOSH           | 165065 |
|          |                            |          | K8  | RELAY REED FORM 1A 5V 500 OHMS | 087050 | R48 | RES MF 1K 1% 1/4W              | 144090 | V7       | TUBE 12AX7A MCINTOSH           | 165065 |
|          |                            |          | K9  | RELAY REED FORM 1A 5V 500 OHMS | 087050 | R49 | RES NETWORK 2X220K ISO         | 144262 |          |                                |        |
|          |                            |          | K10 | RELAY REED FORM 1A 5V 500 OHMS | 087050 | R50 | RES MF 221 OHM 1% 1/4W         | 144172 |          |                                |        |
|          |                            |          | K11 | RELAY REED FORM 1A 5V 500 OHMS | 087050 | R51 | RES MF 221 OHM 1% 1/4W         | 144172 | <b>3</b> | <b>049966 CONTROL PCB</b>      |        |
|          |                            |          | K12 | RELAY REED FORM 1A 5V 500 OHMS | 087050 | R52 | RES MF 100K 1% 1/4W            | 144113 | C1       | CAP ELECT 47UF 35V             | 066446 |
|          |                            |          | K13 | RELAY REED FORM 1A 5V 500 OHMS | 087050 | R53 | RES MF 2.74K 1% 1/4W           | 144304 | C2       | CAP MONO .1uF 50V 20% Z5U      | 061305 |
|          |                            |          | K16 | RELAY REED FORM 1C 5V 125 OHM  | 087056 | R54 | RES MF 2.74K 1% 1/4W           | 144304 | C3       | CAP MONO 220PF 100V 10% NPO    | 061301 |
|          |                            |          | K17 | RELAY REED FORM 1C 5V 125 OHM  | 087056 | R55 | RES MF 2.74K 1% 1/4W           | 144304 | C4       | CAP MONO .1uF 50V 20% Z5U      | 061305 |
|          |                            |          | K18 | RELAY REED FORM 1A 5V 500 OHMS | 087050 | R56 | RES MF 2.74K 1% 1/4W           | 144304 | C5       | CAP ELECT 10UF 50V             | 066445 |
|          |                            |          | K19 | RELAY REED FORM 1A 5V 500 OHMS | 087050 | R57 | RES MF 221K 1% 1/4W            | 144421 | DS1      | LED GREEN 5MM HI-INTENSITY     | 058165 |
|          |                            |          |     |                                |        |     |                                |        | DS2      | LED GREEN 5MM HI-INTENSITY     | 058165 |

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|      |                                |        |     |                                |        |     |                               |        |     |                               |        |
|------|--------------------------------|--------|-----|--------------------------------|--------|-----|-------------------------------|--------|-----|-------------------------------|--------|
| DS4  | LED GREEN 5MM HI-INTENSITY     | 058165 | K4  | RELAY REED FORM 1A 5V 500 OHMS | 087050 | U7  | IC DC MOTOR DRIVER            | 133191 | MT1 | SENSOR IR 38KHZ               | 121046 |
| DS5  | LED GREEN 5MM HI-INTENSITY     | 058165 | R1  | RES NETWORK 2X220K ISO         | 144262 |     |                               |        | R1  | RES MF 324 OHM 1% 1/4W        | 144338 |
| DS6  | LED GREEN 5MM HI-INTENSITY     | 058165 | R2  | RES NETWORK 2X220K ISO         | 144262 | ◇6  | <b>049969 DATA PCB</b>        |        | R2  | RES MF 100 OHM 1% 1/4W        | 144196 |
| DS7  | LED GREEN 5MM HI-INTENSITY     | 058165 | R3  | RES NETWORK 2X220K ISO         | 144262 | C1  | CAP MONO .1uF 50V 20% Z5U     | 061305 | R14 | RES MF 499 1% 1/4W            | 144087 |
| DS9  | LED SQUARE RED                 | 058109 | R4  | RES NETWORK 2X220K ISO         | 144262 | C2  | CAP MONO 1000PF 50V 10% NPO   | 061303 | S1  | SWITCH PB TACT                | 150058 |
| DS10 | LED SQUARE RED                 | 058109 |     |                                |        | C3  | CAP MONO .1uF 50V 20% Z5U     | 061305 | S2  | SWITCH PB TACT                | 150058 |
| DS11 | LED SQUARE RED                 | 058109 | ◇5  | <b>049968 VOLUME/TONE PCB</b>  |        | C4  | CAP MONO .1uF 50V 20% Z5U     | 061305 | S3  | SWITCH PB TACT                | 150058 |
| DS12 | LED SQUARE RED                 | 058109 | C1  | CAP ELECT 10UF 50V             | 066445 | C5  | CAP MONO 220PF 100V 10% NPO   | 061301 | S4  | SWITCH PB TACT                | 150058 |
| DS13 | LED SQUARE RED                 | 058109 | C2  | CAP ELECT 47UF 35V             | 066446 | D1  | DIODE SILICON                 | 070047 | S5  | SWITCH PB TACT                | 150058 |
| DS14 | LED SQUARE RED                 | 058109 | C3  | CAP MONO 100PF 100V 10% NPO    | 061300 | D2  | DIODE SILICON                 | 070047 |     |                               |        |
| DS15 | LED GREEN 5MM HI-INTENSITY     | 058165 | C4  | CAP MONO 100PF 100V 10% NPO    | 061300 | D3  | DIODE SILICON                 | 070047 | ◇8  | <b>049971 AMPLIFIER PCB</b>   |        |
| J1   | CONN FFC 18PIN                 | 117765 | C5  | CAP MONO .1uF 50V 20% Z5U      | 061305 | J1  | JACK HEADPHONE STEREO 1/8IN   | 117759 | C1  | CAP MONO 220PF 100V 10% NPO   | 061301 |
| J2   | CONN FFC 18PIN                 | 117765 | C6  | CAP MONO .1uF 50V 20% Z5U      | 061305 | J2  | JACK HEADPHONE STEREO 1/8IN   | 117759 | C2  | CAP ELECT 470UF 16V           | 066508 |
| J3   | CONN 12 PIN FFC                | 117720 | C7  | CAP ELECT 10UF 50V             | 066445 | J3  | JACK HEADPHONE STEREO 1/8IN   | 117759 | C3  | CAP MONO .1uF 50V 20% Z5U     | 061305 |
| Q1   | TRANSISTOR NPN SILICON         | 132171 | C8  | CAP ELECT 47UF 35V             | 066446 | J4  | JACK HEADPHONE STEREO 1/8IN   | 117759 | C4  | CAP MONO .1uF 50V 20% Z5U     | 061305 |
| Q2   | TRANSISTOR NPN                 | 132223 | C9  | CAP MONO 100PF 100V 10% NPO    | 061300 | J5  | JACK HEADPHONE STEREO 1/8IN   | 117759 | C5  | CAP POLYPROP 0.22UF 20% 1KVDC | 064432 |
| R1   | RES MF 10K 1% 1/4W             | 144053 | C10 | CAP MONO 100PF 100V 10% NPO    | 061300 | J6  | JACK HEADPHONE STEREO 1/8IN   | 117759 | C6  | CAP POLYPROP 0.22UF 20% 1KVDC | 064432 |
| R2   | RES MF 10 OHM 1% 1/4W          | 144157 | C11 | CAP ELECT 220UF 50V 20%        | 066254 | J7  | JACK HEADPHONE STEREO 1/8IN   | 117759 | C7  | CAP MONO 100PF 100V 10% NPO   | 061300 |
| R3   | RES NET 10K X8 RES B           | 144253 | C12 | CAP ELECT 47UF 10V BP          | 066378 | J8  | CONN 12 PIN FFC               | 117720 | C8  | CAP MONO 100PF 100V 10% NPO   | 061300 |
| R4   | RES NETWORK 9X-1-223           | 144238 | C13 | CAP ELECT 22UF 100V            | 066506 | J9  | CONN GOLD F RIGHT ANGLE       | 117661 | C10 | CAP ELECT 470UF 16V           | 066508 |
| R5   | RES MF 301 OHM 1% 1/4W         | 144484 | C14 | CAP MPF 0.033UF 5% 63VDC       | 064318 | J10 | JACK HEADPHONE STEREO 1/8IN   | 117759 | C11 | CAP ELECT 10UF 50V            | 066445 |
| R6   | RES MF 301 OHM 1% 1/4W         | 144484 | C15 | CAP MONO .1uF 50V 20% Z5U      | 061305 | J11 | JACK HEADPHONE STEREO 1/8IN   | 117759 | F1  | FUSE T 0.4A 250V              | 089108 |
| R7   | RES MF 806 OHM 1% 1/4W         | 144089 | C16 | CAP MONO .1uF 50V 20% Z5U      | 061305 | R1  | RES MF 100 OHM 1% 1/4W        | 144196 | J1  | CONN 12 PIN FFC               | 117720 |
| R8   | RES MF 10K 1% 1/4W             | 144053 | C17 | CAP MPF 0.033UF 5% 63VDC       | 064318 | R2  | RES MF 100 OHM 1% 1/4W        | 144196 | J2  | BLADE FASTON W/FEET           | 117708 |
| R9   | RES MF 324 OHM 1% 1/4W         | 144338 | C18 | CAP ELECT 22UF 100V            | 066506 | R3  | RES MF 1K 1% 1/4W             | 144090 | J3  | BLADE FASTON W/FEET           | 117708 |
| R10  | RES MF 2.21K 1% 1/4W           | 144298 | C19 | CAP MPF 0.033UF 5% 63VDC       | 064318 | R4  | RES MF 100 OHM 1% 1/4W        | 144196 | J4  | BLADE FASTON W/FEET           | 117708 |
| R11  | RES MF 324 OHM 1% 1/4W         | 144338 | C20 | CAP MPF 0.033UF 5% 63VDC       | 064318 | R5  | RES MF 1K 1% 1/4W             | 144090 | J5  | BLADE FASTON W/FEET           | 117708 |
| R12  | RES MF 324 OHM 1% 1/4W         | 144338 | C42 | CAP ELECT 220UF 25V            | 066507 | R6  | RES MF 1K 1% 1/4W             | 144090 | J6  | BLADE FASTON W/FEET           | 117708 |
| R13  | RES MF 324 OHM 1% 1/4W         | 144338 | D1  | DIODE SILICON                  | 070047 | R7  | RES MF 100 OHM 1% 1/4W        | 144196 | J7  | CONN PCB MOUNT POWER RED      | 117719 |
| R15  | RES NETWORK 9X-1-223           | 144238 | J1  | CONN 23 PIN FFC                | 117715 | R8  | RES MF 100 OHM 1% 1/4W        | 144196 | J9  | BLADE FASTON W/FEET           | 117708 |
| R16  | RES MF 1K 1% 1/4W              | 144090 | K1  | RELAY REED FORM 1A 5V 500 OHMS | 087050 | R9  | RES MF 100 OHM 1% 1/4W        | 144196 | L1  | CHOKE 2.2mH                   | 122001 |
| R17  | RES MF 6.49K 1% 1/4W           | 144140 | K2  | RELAY REED FORM 1A 5V 500 OHMS | 087050 | R10 | RES MF 100 OHM 1% 1/4W        | 144196 | L2  | CHOKE 2.2mH                   | 122001 |
| R18  | RES MF 240 OHM 1% 1/4W         | 144338 | K3  | RELAY REED FORM 1A 5V 500 OHMS | 087050 | R11 | RES MF 1K 1% 1/4W             | 144090 | Q2  | TRANSISTOR N JFET             | 132222 |
| R19  | RES MF 240 OHM 1% 1/4W         | 144338 | K4  | RELAY REED FORM 1A 5V 500 OHMS | 087050 | R12 | RES MF 10 OHM 1% 1/4W         | 144157 | Q3  | TRANSISTOR NPN                | 132136 |
| R20  | RES MF 240 OHM 1% 1/4W         | 144338 | R1  | POT 50KAX2                     | 134490 | R13 | RES MF 221 OHM 1% 1/4W        | 144172 | Q4  | TRANSISTOR NPN                | 132136 |
| R21  | RES MF 240 OHM 1% 1/4W         | 144338 | R2  | RES MF 1K 1% 1/4W              | 144090 | R14 | RES MF 61.9K OHM 1/4W         | 144335 | Q5  | TRANSISTOR NPN                | 132136 |
| R22  | RES MF 100K 1% 1/4W            | 144113 | R3  | RES MF 3.32K 1% 1/4W           | 144095 | R15 | RES MF 10 OHM 1% 1/4W         | 144157 | Q6  | TRANSISTOR NPN                | 132136 |
| R23  | RES MF 240 OHM 1% 1/4W         | 144338 | R4  | POT BALANCE 2KOHM              | 134464 | R16 | RES MF 22.1K 1% 1/4W          | 144187 | Q7  | TRANSISTOR N JFET             | 132222 |
| R24  | RES MF 240 OHM 1% 1/4W         | 144338 | R5  | RES MF 475K 1% 1/4W            | 144364 | R17 | RES MF 182 OHM 1/4W 1%        | 144273 | Q8  | TRANSISTOR N JFET             | 132222 |
| S1   | PC BD SWITCH                   | 129294 | R6  | RES MF 1K 1% 1/4W              | 144090 | R18 | RES MF 182 OHM 1/4W 1%        | 144273 | Q9  | TRANSISTOR N JFET             | 132222 |
| U1   | IC SUPERVISOR WITH EEPROM      | 133468 | R7  | RES MF 475K 1% 1/4W            | 144364 | R19 | RES MF 2.21K 1% 1/4W          | 144298 | R5  | RES MF 2.21M 1/4W             | 144265 |
| U2   | IC PROGRAMMED MC2275 V1.00     | 133523 | R8  | RES MF 3.32K 1% 1/4W           | 144095 | R20 | RES MF 182 OHM 1/4W 1%        | 144273 | R6  | RES MF 10K 1% 1/4W            | 144053 |
| U3   | IC SHFT REG SER-PAR            | 133186 | R9  | RES MF 10 OHM 1% 1/4W          | 144157 | R21 | RES MF 182 OHM 1/4W 1%        | 144273 | R7  | RES MF 1.82K 1% 1/4W          | 144296 |
| U4   | IC SHFT REG SER-PAR            | 133186 | R10 | RES MF 10 OHM 1% 1/4W          | 144157 | R22 | RES MF 2.21K 1% 1/4W          | 144298 | R8  | RES MF 40.2K 1% 1/4W          | 144107 |
| U5   | IC AND 2 INPUT X 4             | 133175 | R11 | RES MF 10 OHM 1% 1/4W          | 144157 | R23 | RES MF 2.21K 1% 1/4W          | 144298 | R9  | RES MF 10K 1% 1/4W            | 144053 |
| Y1   | RESONATOR CERAMIC 6.0MHZ W/CAP | 180039 | R12 | RES MF 10 OHM 1% 1/4W          | 144157 | SP1 | BRACKET PCB CARD MOUNTING     | 003611 | R10 | RES MF 2.21M 1/4W             | 144265 |
|      |                                |        | R13 | RES MF 681 OHM 1% 1/4W         | 144195 | SP2 | BRACKET PCB CARD MOUNTING     | 003611 | R11 | RES MF 2.74K 1% 1/4W          | 144304 |
|      |                                |        | R14 | RES MF 1M 1/4W                 | 144269 | U1  | IC SHFT REG SER-PAR           | 133186 | R12 | RES MO 46.4k 1% 1W            | 144436 |
| ◇4   | <b>049967 BALANCED PCB</b>     |        | R15 | RES MF 100K 1% 1/4W            | 144113 | U2  | IC 8 LN DRIVER ARRAY          | 133180 | R13 | RES MO 46.4k 1% 1W            | 144436 |
| C1   | CAP ELECT 10UF 50V             | 066445 | R16 | RES MF 475 OHM 1% 1/4W         | 144086 | U3  | IC OPERATIONAL AMPLIFIER      | 133189 | R14 | RES MF 10K 1% 1/4W            | 144053 |
| C2   | CAP ELECT 10UF 50V             | 066445 | R17 | POTENTIOMETER                  | 134457 | U4  | IC AND 2 INPUT X 4            | 133175 | R15 | RES MF 121K 1% 1/4W           | 144418 |
| C3   | CAP ELECT 10UF 50V             | 066445 | R18 | POTENTIOMETER                  | 134457 |     |                               |        | R16 | RES MF 47.5K 1% 1/4W          | 144108 |
| C4   | CAP ELECT 10UF 50V             | 066445 | R19 | RES MF 1M 1/4W                 | 144269 | ◇7  | <b>049970 PUSHBUTTON PCB</b>  |        | R17 | RES MF 1K 1% 1/4W             | 144090 |
| C5   | CAP ELECT 10UF 50V             | 066445 | R20 | RES MF 681 OHM 1% 1/4W         | 144195 | C1  | CAP MONO .1uF 50V 20% Z5U     | 061305 | R19 | RES MF 1M 1/4W                | 144269 |
| C6   | CAP ELECT 10UF 50V             | 066445 | R21 | RES MF 1M 1/4W                 | 144269 | C2  | CAP ELECT 47UF 16V 6.3X5 CASE | 066380 | R20 | RES MF 1M 1/4W                | 144269 |
| C7   | CAP ELECT 10UF 50V             | 066445 | R22 | RES MF 100K 1% 1/4W            | 144113 | DS1 | LED SQUARE RED                | 058109 | R21 | RES MF 332k 1% .5W            | 144355 |
| C8   | CAP ELECT 10UF 50V             | 066445 | R23 | RES MF 475 OHM 1% 1/4W         | 144086 | DS2 | LED SQUARE RED                | 058109 | R22 | RES MO 100K 5% 2W             | 144438 |
| D1   | DIODE SILICON                  | 070047 | R24 | RES MF 1M 1/4W                 | 144269 | DS3 | LED SQUARE RED                | 058109 | R23 | RES MO 100K 5% 2W             | 144438 |
| J1   | XLR FEMALE VERTICAL WITH LATCH | 117813 | R25 | RES MF 1K 1% 1/4W              | 144090 | DS4 | LED SQUARE RED                | 058109 | R24 | RES MO 100K 5% 2W             | 144438 |
| J2   | XLR FEMALE VERTICAL WITH LATCH | 117813 | R26 | RES MF 1K 1% 1/4W              | 144090 | DS5 | LED SQUARE RED                | 058109 | R25 | RES MO 100K 5% 2W             | 144438 |
| J3   | CONN 12 PIN FFC                | 117720 | R53 | RES MF 10 OHM 1% 1/4W          | 144157 | DS8 | LED ARRAY(4) YELLOW SQUARE    | 058126 | R27 | RES WW 220 OHM 10% 5W         | 139009 |
| K1   | RELAY REED FORM 1A 5V 500 OHMS | 087050 | U1  | IC DUAL OPERATIONAL AMPLIFIER  | 133260 | J1  | CONN FFC 18PIN                | 117765 | R28 | RES WW 220 OHM 10% 5W         | 139009 |
| K2   | RELAY REED FORM 1A 5V 500 OHMS | 087050 | U2  | IC OPAMP NE4558N               | 133028 | J2  | JACK PHONO 1/8 STEREO VER     | 117462 | R30 | RES MF 17.4K 1% 1/4W          | 144413 |
| K3   | RELAY REED FORM 1A 5V 500 OHMS | 087050 |     |                                |        |     |                               |        |     |                               |        |

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|     |                               |        |
|-----|-------------------------------|--------|
| R31 | RES MF 332k 1% .5W            | 144355 |
| R32 | RES MF 2.74K 1% 1/4W          | 144304 |
| R33 | RES MF 10K 1% 1/4W            | 144053 |
| R34 | RES MF 2.21M 1/4W             | 144265 |
| R35 | RES MF 2.21M 1/4W             | 144265 |
| R36 | RES MF 2.74K 1% 1/4W          | 144304 |
| R37 | RES MF 2.74K 1% 1/4W          | 144304 |
| U1  | IC DUAL OPERATIONAL AMPLIFIER | 133260 |
| V1  | TUBE 12AT7                    | 165067 |
| V2  | TUBE KT88                     | 165069 |
| V3  | TUBE KT88                     | 165069 |

## ⑨ 049972 POWER SUPPLY PCB

|     |                                |        |
|-----|--------------------------------|--------|
| C1  | CAP MONO .47uF 50V             | 061249 |
| C2  | CAP POLY .047UF 10% 1000VDC    | 064434 |
| C3  | CAP ELECT 680UF 315V           | 066549 |
| C4  | CAP ELECT 680UF 315V           | 066549 |
| C5  | CAP ELECT 47UF 450V            | 066497 |
| C6  | CAP ELECT 33UF 500V            | 066542 |
| C7  | CAP ELECT 47UF 450V            | 066497 |
| C8  | CAP ELECT 1UF 50V              | 066510 |
| C9  | CAP ELECT 680UF 315V           | 066549 |
| C10 | CAP ELECT 680UF 315V           | 066549 |
| C11 | CAP ELECT 4700UF 35V           | 066541 |
| C12 | CAP ELECT 10UF 50V             | 066445 |
| C13 | CAP POLYPROP .047UF 10% 250VDC | 064364 |
| C14 | CAP ELECT 4700UF 35V           | 066541 |
| C15 | CAP ELECT 10UF 50V             | 066445 |
| D1  | DIODE BRID RECT 1000V 6A       | 070165 |
| D2  | DIODE ZENER 150V               | 070170 |
| D3  | DIODE ZENER 150V               | 070170 |
| D4  | DIODE RECTIFIER 1N4007         | 070169 |
| D5  | DIODE RECTIFIER 1N4007         | 070169 |
| D6  | DIODE SIL 400 PIV @ 1.5A       | 070031 |
| D7  | DIODE SIL 400 PIV @ 1.5A       | 070031 |
| D8  | DIODE SIL 400 PIV @ 1.5A       | 070031 |
| D9  | DIODE SIL 400 PIV @ 1.5A       | 070031 |
| D10 | DIODE SILICON                  | 070047 |
| F1  | FUSE 2A 250V SLO-BLO 5X20 IEC  | 089088 |
| F2  | FUSE 2A 250V SLO-BLO 5X20 IEC  | 089088 |
| GP1 | BRACKET PCB CARD MOUNTING      | 003611 |
| GP2 | BRACKET PCB CARD MOUNTING      | 003611 |
| J1  | BLADE FASTON .187              | 117726 |
| J2  | BLADE FASTON .187              | 117726 |
| J3  | BLADE FASTON W/FEET            | 117708 |
| J4  | BLADE FASTON W/FEET            | 117708 |
| J5  | BLADE FASTON W/FEET            | 117708 |
| J6  | BLADE FASTON W/FEET            | 117708 |
| J7  | BLADE FASTON W/FEET            | 117708 |
| J8  | BLADE FASTON W/FEET            | 117708 |
| J9  | BLADE FASTON W/FEET            | 117708 |
| J10 | BLADE FASTON W/FEET            | 117708 |
| J11 | CONN 12 PIN FFC                | 117720 |
| J12 | BLADE FASTON W/FEET            | 117708 |
| J13 | BLADE FASTON W/FEET            | 117708 |
| J14 | BLADE FASTON W/FEET            | 117708 |
| J16 | CONN PCB MOUNT POWER RED       | 117719 |
| J17 | CONN PCB MOUNT POWER RED       | 117719 |
| J18 | HEADER 9 CIRCUIT POST NATURAL  | 117724 |
| Q1  | TRANSISTOR: NPN POWER          | 132295 |
| Q2  | TRANSISTOR NPN                 | 132223 |
| Q3  | TRANSISTOR PNP                 | 132224 |
| Q6  | TRANSISTOR P FET 1-4PO 250 OHM | 132220 |

|     |                     |        |
|-----|---------------------|--------|
| R1  | RES MO 18K 5% 1W    | 144286 |
| R2  | RES MO 100K 5% 2W   | 144438 |
| R4  | RES MF 2.74M 1/4W   | 144271 |
| R5  | RES MF 100K 1% 1/4W | 144113 |
| R6  | RES MF 100K 1% 1/4W | 144113 |
| R7  | RES MF 1M 1/4W      | 144269 |
| R8  | RES MF 221K 1% 1/4W | 144421 |
| R9  | RES MF 100K 1% 1/4W | 144113 |
| R10 | RES MO 2.2K 5% 2W   | 144494 |
| R75 | RES MO 100K 5% 2W   | 144438 |
| R76 | RES MO 100K 5% 2W   | 144438 |
| U2  | IC REGULATOR 15V    | 133154 |
| U3  | IC REGULATOR -15V   | 133153 |

## ⑩ 049973 METER PCB

|     |                               |        |
|-----|-------------------------------|--------|
| C1  | CAP MONO .1uF 50V 20% Z5U     | 061305 |
| C2  | CAP MONO .1uF 50V 20% Z5U     | 061305 |
| C3  | CAP MONO .1uF 50V 20% Z5U     | 061305 |
| C4  | CAP ELECT 100UF 25V           | 066161 |
| C5  | CAP MPF 0.1UF 100V            | 064337 |
| C6  | CAP MPF 0.22UF 5% 63VDC       | 064329 |
| C7  | CAP MPF 0.1UF 100V            | 064337 |
| C8  | CAP MPF 0.22UF 5% 63VDC       | 064329 |
| C9  | CAP ELECT 2.2UF 50V           | 066511 |
| C10 | CAP ELECT 2.2UF 50V           | 066511 |
| D1  | DIODE ZENER 5V                | 070132 |
| D2  | DIODE SILICON                 | 070047 |
| D3  | DIODE SILICON                 | 070047 |
| D4  | DIODE SILICON                 | 070047 |
| D5  | DIODE SILICON                 | 070047 |
| D6  | DIODE SILICON                 | 070047 |
| D7  | DIODE SILICON                 | 070047 |
| D8  | DIODE SILICON                 | 070047 |
| D9  | DIODE SILICON                 | 070047 |
| D10 | DIODE SILICON                 | 070047 |
| D11 | DIODE SILICON                 | 070047 |
| D12 | DIODE SILICON                 | 070047 |
| D13 | DIODE SILICON                 | 070047 |
| DS1 | LED BLUE 5MM HI-INTENSITY     | 058166 |
| DS2 | LED GREEN 5MM HI-INTENSITY    | 058165 |
| DS3 | LED BLUE 5MM HI-INTENSITY     | 058166 |
| DS4 | LED GREEN 5MM HI-INTENSITY    | 058165 |
| DS5 | LED BLUE 5MM HI-INTENSITY     | 058166 |
| DS6 | LED GREEN 5MM HI-INTENSITY    | 058165 |
| DS7 | LED BLUE 5MM HI-INTENSITY     | 058166 |
| DS8 | LED GREEN 5MM HI-INTENSITY    | 058165 |
| J2  | BLADE FASTON W/FEET           | 117708 |
| J3  | CONN 12 PIN FFC               | 117720 |
| J4  | CONN 3 POS MALE MTS100 NORMAL | 117214 |
| J5  | HEADER 2 PIN LATCHING         | 117766 |
| J6  | HEADER 2 PIN LATCHING         | 117766 |
| J7  | BLADE FASTON W/FEET           | 117708 |
| Q1  | TRANSISTOR NPN                | 132223 |
| Q2  | TRANSISTOR NPN                | 132223 |
| Q3  | TRANSISTOR NPN                | 132254 |
| Q4  | TRANSISTOR NPN                | 132254 |
| Q5  | TRANSISTOR NPN                | 132254 |
| Q6  | TRANSISTOR NPN                | 132254 |
| Q7  | TRANSISTOR NPN                | 132223 |
| Q8  | TRANSISTOR NPN                | 132223 |
| Q9  | TRANSISTOR NPN                | 132223 |
| R1  | RES MF 475 OHM 1% 1/4W        | 144086 |
| R2  | RES MF 10 OHM 1% 1/4W         | 144157 |

|     |                                |        |
|-----|--------------------------------|--------|
| R3  | RES MF 22.1K 1% 1/4W           | 144187 |
| R4  | RES MF 22.1K 1% 1/4W           | 144187 |
| R5  | RES MF 68.1K 1% 1/4W           | 144081 |
| R6  | RES MF 68.1K 1% 1/4W           | 144081 |
| R7  | RES MF 10.2K 1% 1/4W           | 144130 |
| R8  | RES MF 10.2K 1% 1/4W           | 144130 |
| R9  | RES MF 10M 1% 1/4W             | 144264 |
| R10 | RES MF 121K 1% 1/4W            | 144418 |
| R11 | RES MF 10M 1% 1/4W             | 144264 |
| R12 | RES MF 121K 1% 1/4W            | 144418 |
| R13 | POT TRIM 100K OHM 20%          | 134383 |
| R14 | POT TRIM 100K OHM 20%          | 134383 |
| R15 | RES MF 100 OHM 1% 1/4W         | 144196 |
| R16 | RES MF 100 OHM 1% 1/4W         | 144196 |
| R17 | RES MF 221K 1% 1/4W            | 144421 |
| R18 | RES MF 2.21M 1/4W              | 144265 |
| R19 | RES MF 2.21M 1/4W              | 144265 |
| R20 | RES MF 187K 1% 1/4W            | 144406 |
| R21 | RES MF 187K 1% 1/4W            | 144406 |
| R22 | RES MF 4.75K 1% 1/4W           | 144097 |
| R23 | RES MF 1.21K 1% 1/4W           | 144191 |
| R24 | RES MF 10K 1% 1/4W             | 144053 |
| R25 | RES MF 4.75K 1% 1/4W           | 144097 |
| R26 | RES MF 1.21K 1% 1/4W           | 144191 |
| R27 | RES MF 10K 1% 1/4W             | 144053 |
| R28 | POT TRIM 500 OHM 20% HORIZ ADJ | 134410 |
| R29 | POT TRIM 500 OHM 20% HORIZ ADJ | 134410 |
| R30 | POT TRIM 500 OHM 20% HORIZ ADJ | 134410 |
| R31 | POT TRIM 500 OHM 20% HORIZ ADJ | 134410 |
| R32 | RES MF 221 OHM 1% 1/4W         | 144172 |
| R33 | RES MF 221 OHM 1% 1/4W         | 144172 |
| R34 | RES MF 221 OHM 1% 1/4W         | 144172 |
| R35 | RES MF 221 OHM 1% 1/4W         | 144172 |
| U1  | IC DUAL OPERATIONAL AMPLIFIER  | 133260 |
| U2  | IC DUAL OPERATIONAL AMPLIFIER  | 133260 |

## ⑪ 050007 BACKUP POWER SUPPLY PCB

|     |                          |        |
|-----|--------------------------|--------|
| C2  | CAP ELECT 4700UF 35V     | 066541 |
| D1  | DIODE SILICON            | 070047 |
| D2  | DIODE SIL 400 PIV @ 1.5A | 070031 |
| D3  | DIODE SIL 400 PIV @ 1.5A | 070031 |
| D4  | DIODE SIL 400 PIV @ 1.5A | 070031 |
| D5  | DIODE SIL 400 PIV @ 1.5A | 070031 |
| F1  | FUSE 1A 250V SB 5X20 IEC | 089107 |
| J1  | BLADE FASTON W/FEET      | 117708 |
| J2  | BLADE FASTON W/FEET      | 117708 |
| J3  | BLADE FASTON W/FEET      | 117708 |
| J4  | BLADE FASTON W/FEET      | 117708 |
| J5  | BLADE FASTON W/FEET      | 117708 |
| J6  | BLADE FASTON W/FEET      | 117708 |
| J7  | BLADE FASTON W/FEET      | 117708 |
| J8  | BLADE FASTON W/FEET      | 117708 |
| J9  | BLADE FASTON W/FEET      | 117708 |
| J10 | BLADE FASTON W/FEET      | 117708 |
| J11 | CONN 12 PIN FFC          | 117720 |
| J12 | BLADE FASTON W/FEET      | 117708 |
| J13 | BLADE FASTON W/FEET      | 117708 |
| J14 | BLADE FASTON W/FEET      | 117708 |
| J15 | BLADE FASTON W/FEET      | 117708 |
| J16 | BLADE FASTON W/FEET      | 117708 |
| J17 | BLADE FASTON W/FEET      | 117708 |
| J18 | BLADE FASTON W/FEET      | 117708 |
| K1  | RELAY POWER TV5 12V      | 087070 |

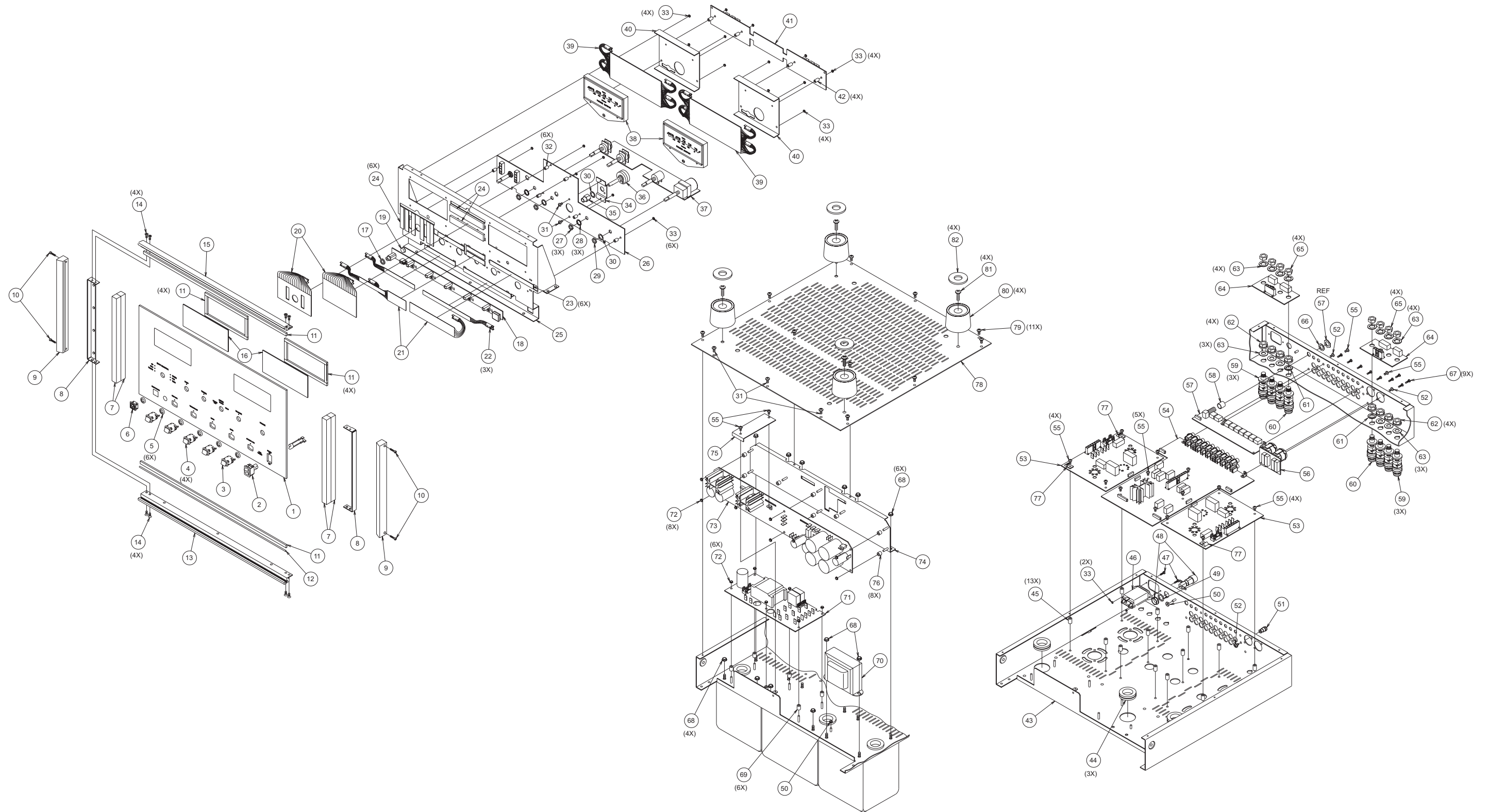
|     |                         |        |
|-----|-------------------------|--------|
| K2  | RELAY POWER TV5 12V     | 087070 |
| Q1  | TRANSISTOR NPN          | 132223 |
| R1  | RES MF 2.21K 1% 1/4W    | 144298 |
| R2  | RES MF 10 OHM 1% 1/4W   | 144157 |
| RT1 | THERMISTER 5 OHM        | 144151 |
| T1  | TRANSFORMER LOW PROFILE | 159342 |
| TP1 | CONN 4 PIN              | 117215 |
| TP2 | CONN 4 PIN              | 117215 |

## ⑫ 050052 TERMINAL PCB

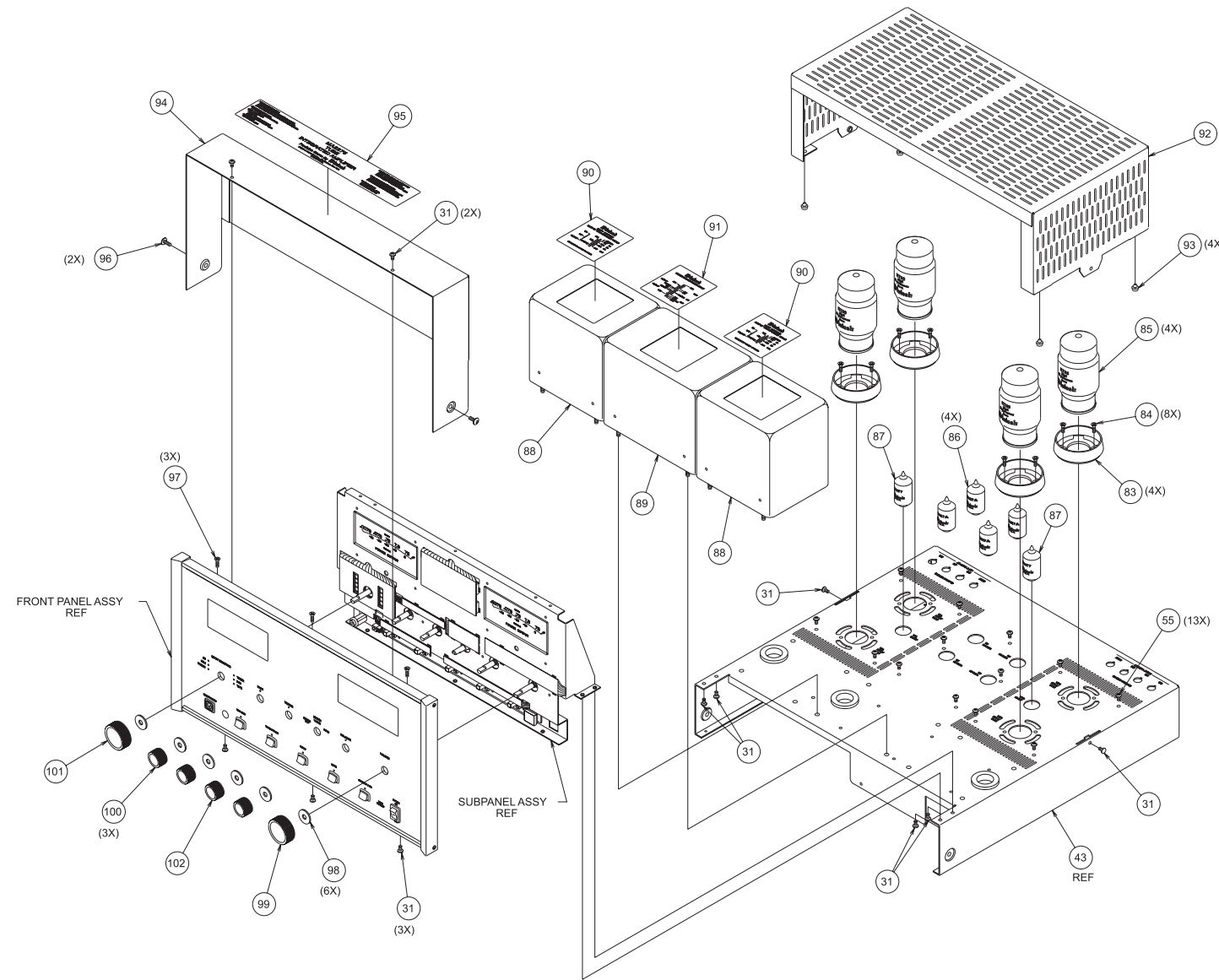
|    |                       |        |
|----|-----------------------|--------|
| C1 | CAP MPF 0.22UF 400VDC | 064438 |
| C2 | CAP MPF 0.22UF 400VDC | 064438 |
| J1 | HEADER 4 CIRCUIT POST | 117772 |
| J2 | HEADER 4 CIRCUIT POST | 117772 |
| R1 | RES WW 4 OHM 5% 5W    | 139119 |
| R2 | RES WW 4 OHM 5% 5W    | 139119 |



# EXPLODED VIEW and PARTS LIST



# EXPLODED VIEW con't and PARTS LIST



| Ref No. | Part No. | Description                        |
|---------|----------|------------------------------------|
| 1       | 016495   | GLASS                              |
| 2       | 171026   | CABLE ASSY POWER SWITCH            |
| 3       | 017531   | PUSHBUTTON ASSY RED                |
| 4       | 017517   | PUSHBUTTON ASSY BLK                |
| 5       | 078033   | O-RING                             |
| 6       | 017854   | BEZEL HEADPHONE                    |
| 7       | 094360   | TAPE FOAM 1/2 X 1/2                |
| 8       | 004939   | BRACKET EXTRUSION                  |
| 9       | 018515   | END CAP 9"                         |
| 10      | 101042   | SCREW TS 4-40 X 1/2 SLOT FILL      |
| 11      | 094016   | TAPE FOAM 1/4 X 1/8                |
| 12      | 098113   | CORD DIAL .027 BLK BRAID SILK      |
| 13      | 018706   | EXTRUSION BOTTOM                   |
| 14      | 100149   | SCREW MACH 6-32 X 1/4 FL U/H ST    |
| 15      | 018738   | EXTRUSION TOP                      |
| 16      | 092443   | FILTER METER                       |
| 17      | 078037   | O-RING                             |
| 18      | 049970   | ASSY PUSHBUTTON PCB                |
| 19      | 017191   | BUMPER BUTTON                      |
| 20      | 017921   | LOGO/SELECTOR BACKLIGHT            |
| 21      | 017901   | LOGO/ PUSHBUTTON BACKLIGHT         |
| 22      | 017907   | TITLE/PUSHBUTTON BACKLIGHT         |
| 23      | 094431   | TAPE FOAM WHT 3/8W X 1/32 THK      |
| 24      | 094430   | TAPE FOAM WHT 1/2 W X 1/8 THK      |
| 25      | 005347   | SUBPANEL                           |
| 26      | 049966   | ASSY CONTROL PCB                   |
| 27      | 110004   | NUT CONTROL M7 X 0.75 HEX          |
| 28      | 104013   | WASHER LOCK 5/16 X .435 X .002     |
| 29      | 110002   | NUT CONTROL M9 X 0.75 PLATED       |
| 30      | 104014   | WASHER INT STAR 3/8 X .507 X .002  |
| 31      | 101054   | SCREW TAPTITE 6-32 X 1/4 PH PN BLK |
| 32      | 112060   | SPACER 4 X 5/16 STEEL              |
| 33      | 102001   | NUT KEP 4-40 CADMIUM PLATE         |
| 34      | 005390   | SWITCH PLATE                       |
| 35      | 021159   | BUSHING SWITCH                     |
| 36      | 146243   | SWITCH POWER                       |
| 37      | 049968   | ASSY VOLUME/TONE PCB               |
| 38      | 124087   | METER MA2275                       |
| 39      | 017922   | METER BACKLIGHT                    |
| 40      | 005391   | METER PLATE                        |
| 41      | 049973   | ASSY METER PCB                     |
| 42      | 112038   | SPACER STEEL 4 X 3/8 NICKEL PLATE  |
| 43      | 005346   | CHASSIS                            |
| 44      | 078031   | GROMMET RUBBER 1" ID               |
| 45      | 017895   | SPACER NYLON 6-32 X 7/16           |
| 46      | 117755   | RECEPTACLE INPUT & LINE FILTER     |
| 47      | 100178   | SCREW MACH 4-40 X 3/8 PH PN        |
| 48      | 178161   | HOLDER FUSE 5 X 20mm IEC           |
| 49      | 104016   | WASHER INT STAR .5 X .630 X .022   |
| 50      | 102003   | NUT MACH 6-32 W/LOCK               |
| 51      | 084112   | POST GROUND GOLD                   |
| 52      | 100250   | SCREW MACH SEMS 6-32 X 1/4 PH PN   |
| 53      | 049971   | ASSY AMP PCB                       |
| 54      | 049954   | ASSY MAIN PCB                      |
| 55      | 100157   | SCREW MACH 6-32 X 1/4 PH PN        |
| 56      | 049967   | ASSY BALANCED PCB                  |
| 57      | 049969   | ASSY DATA PCB                      |
| 58      | 017673   | SPACER .380 ID X 3/8 L PHENOLIC    |
| 59      | 117740   | POST BINDING RED                   |
| 60      | 117741   | POST BINDING BLK                   |
| 61      | 104178   | WASHER LOCK M10 EXT STAINLESS      |
| 62      | 102052   | NUT GOLD SUPPLIED W/117758         |
| 63      | 104162   | WASHER LOCK INTERNAL TOOTH         |
| 64      | 050052   | ASSY TERMINAL PCB                  |
| 65      | 102051   | NUT HEX M9 X 0.75 GOLD PLATED      |
| 66      | 104014   | WASHER INT STAR 3/8 X .507 X .002  |
| 67      | 101197   | SCREW HI/LO 4-24 X 3/8 PH RD BLK   |
| 68      | 102006   | NUT MACH 10-32 W/LOCK              |
| 69      | 021092   | SPACER 6 X 5/16                    |
| 70      | 122379   | CHOKE FILTER                       |
| 71      | 050007   | ASSY BACKUP POWER SUPPLY PCB       |
| 72      | 102045   | NUT KEP 6-32 SPECIAL               |
| 73      | 049972   | ASSY POWER SUPPLY PCB              |
| 74      | 005348   | SUPPORT BRACKET                    |
| 75      | 005395   | POWER SUPPLY SHIELD                |
| 76      | 021030   | SPACER 6 X 1/4                     |
| 77      | 017160   | TAB MOUNTING .140 DIA MTG          |
| 78      | 005350   | BOTTOM COVER                       |
| 79      | 101078   | SCREW TAP 8-32 X 5/16 PH PN BLK    |
| 80      | 017841   | FOOT                               |
| 81      | 100159   | SCREW MACH 10-32 X 3/4 PH PN BLK   |
| 82      | 024010   | FOOT PAD                           |
| 83      | 017761   | AIR PIPE                           |
| 84      | 100292   | SCREW MACH 6-32 X 3/8 PH FH BLK    |
| 85      | 165069   | TUBE KT88 MCINTOSH                 |
| 86      | 165065   | TUBE 12AX7A MCINTOSH               |
| 87      | 165067   | TUBE 12AT7                         |
| 88      | 050042   | POTTED TRANSFORMER OUTPUT          |
| 89      | 050041   | POTTED TRANSFORMER POWER           |
| 90      | 126986   | DECAL OUTPUT TRANSFORMER           |
| 91      | 126985   | DECAL POWER TRANSFORMER            |
| 92      | 005349   | TUBE COVER                         |
| 93      | 017862   | FOOT PUSH-ON                       |
| 94      | 005389   | DUST COVER                         |
| 95      | 126987   | DECAL TOP COVER                    |
| 96      | 100287   | SCREW MACH 8-32 X 3/8 PH TR HD     |
| 97      | 101232   | SCREW 6-32 X 1/4 PHIL FLAT         |
| 98      | 104017   | WASHER FELT BLK 3/4 X 1/4 X 1/16   |
| 99      | 049695   | ASSY KNOB 34 INDEX METRIC          |
| 100     | 049694   | ASSY KNOB 21 INDEX METRIC          |
| 101     | 049637   | ASSY KNOB 34 METRIC W/O INDEX      |
| 102     | 050055   | ASSY KNOB 21 INDEX AMER            |

# REPACKING INSTRUCTIONS

In the event it is necessary to repack the unit for shipment, the unit must be packed exactly as shown below.

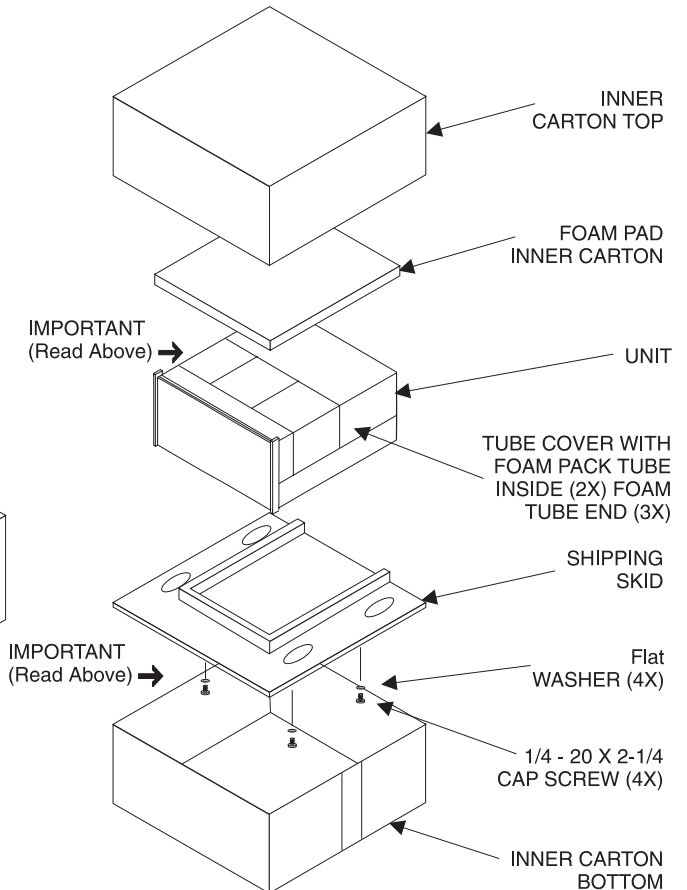
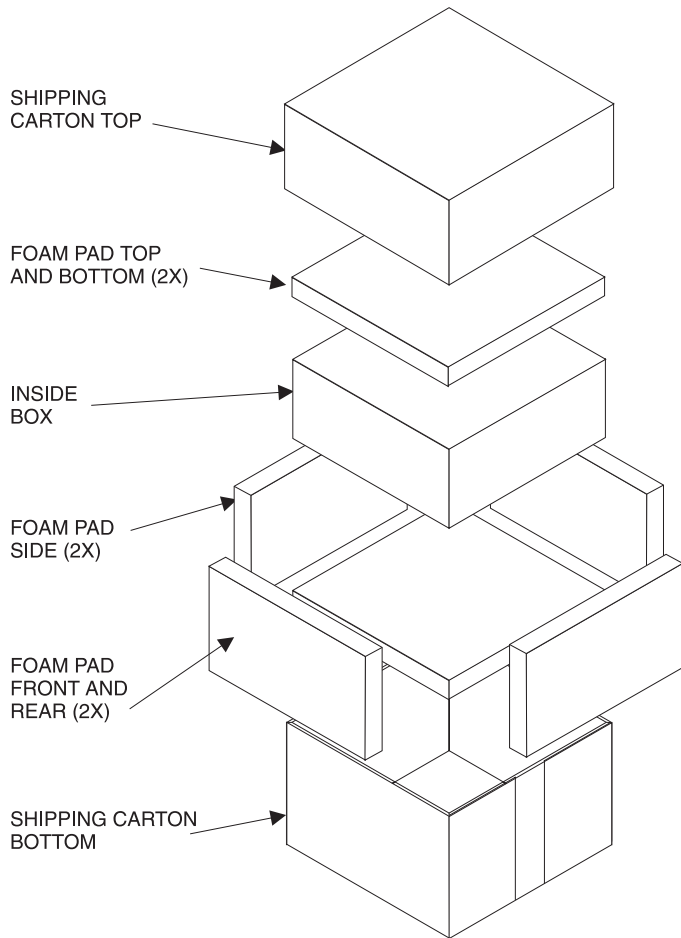
*IMPORTANT - For ease of shipment, attach the four feet to the bottom of the unit. Four, 1/4 - 20 x 2-1/4 bolts with washers must be used to fasten the unit securely to the wood skid. Failure to do this will result in shipping damage.*

*IMPORTANT - Remove Vacuum Tubes from unit and repack in original Tube Pack and place inside Tube Cover before shipping.*

If a shipping carton or any of the interior parts is needed, please call or write the Customer Service Department of McIntosh Laboratory. Order parts from the accompanying list by part number.

Use the original shipping carton and interior parts only if they are in good serviceable condition.

| Qty. | Part No. | Description                |
|------|----------|----------------------------|
| 1    | 034051   | Shipping carton bottom     |
| 2    | 034186   | Foam pad (front and rear)  |
| 2    | 034187   | Foam Pad (side)            |
| 2    | 034054   | Foam pad (top and bottom)  |
| 1    | 034052   | Shipping carton (top)      |
| 1    | 034137   | Inner carton (bottom)      |
| 1    | 034161   | Shipping skid              |
| 1    | 034188   | Foam pad (inner carton)    |
| 1    | 034136   | Inner carton (top)         |
| 4    | 101212   | 1/4 - 20 x 2-1/4 cap screw |
| 4    | 104058   | Flat washer                |
| 2    | 034179   | Tube pack                  |
| 3    | 034180   | Tube pack (end)            |



# MA2275

## TUBE INTEGRATED AMPLIFIER

### SERVICE MANUAL



The continuous improvement of its products is the policy of McIntosh Laboratory Incorporated, who reserve the right to improve design without notice. Because of the constant upgrading of McIntosh products' circuitry and components, the Company cannot insure, and does not warrant, the accuracy of the within schematic material, which is intended for information only.